

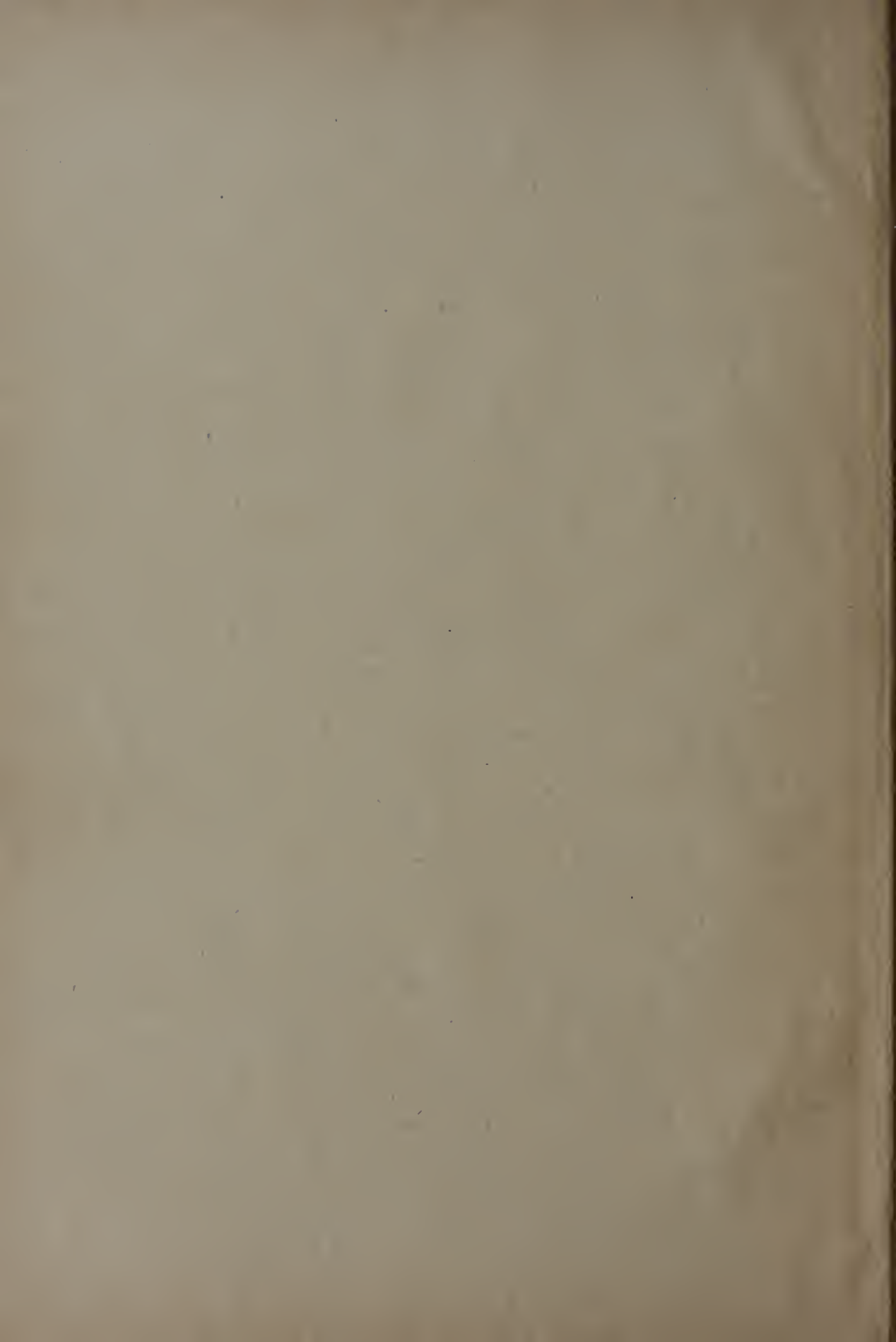
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The New York Academy of Medicine

By *The Publisher*



KENTUCKY MEDICAL JOURNAL

PUBLISHED MONTHLY

BY THE

KENTUCKY STATE MEDICAL ASSOCIATION
INCORPORATED

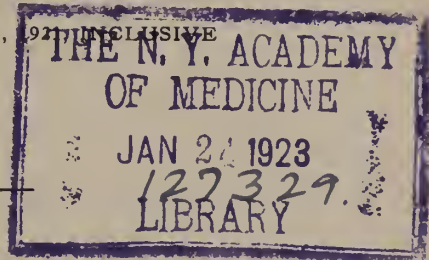
EDITED BY

ARTHUR T. McCORMACK, M. D.

UNDER THE SUPERVISION OF THE COUNCIL

VOLUME XIX.

JANUARY TO DECEMBER, 1921 INCLUSIVE



BOWLING GREEN, KENTUCKY

1921

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KENTUCKY MEDICAL JOURNAL

BEING THE JOURNAL OF THE KENTUCKY STATE MEDICAL ASSOCIATION

Published Under the Auspices of the Council

VOL. XIX.



BOWLING GREEN, KY., JANUARY, 1921

No. 1

EDITORIAL

SUGGESTIONS FOR 1921.

The JOURNAL extends to its 2600 readers cordial good wishes for a Happy New Year.

Both economic and professional skies are somewhat clouded as this message is written and it looks as if everyone is going to be required to retrench and reform from the somewhat extravagant habits which we all contracted during the war.

One of the first reforms we would suggest is that you send your check for your dues to your county secretary immediately upon reading this notice. Doctors can hardly expect other people to pay their bills promptly unless they are in turn prompt. More than fifty of our members paid their 1920 dues during December. None of these men received the JOURNAL last year. They would not have been protected had they been unjustly sued for malpractice, and they received practically none of the benefits of membership. This is neither square to them nor to the Association.

Another suggested reform is to send \$6.00 to the American Medical Association also today. Its address is 535 North Dearborn Street, Chicago. You will receive in return the greatest scientific journal that is published. The American Medical Association is not taking part in the leadership of the profession that it should, and for this reason it is of the utmost importance that every active physician retain his fellowship in it, and use his influence to stimulate the leaders to such exertion as will make us respected as the guardian of the people's health.

May we not urge also upon the profession the importance of developing amongst our patients and their families a demand for a periodical physical examination, and amongst ourselves sufficient ability to make such an examination. At least twice a year, from babyhood up, a competent physician should carefully study one's bodily needs and head off tendencies rather than wait to treat dis-

ease. When you go into the home, especially examine the little ones. You would find it not only interesting but profitable.

Physicians should be sanitary exemplars in their communities. It is hard for you to build sanitary privies if you haven't one at your house. Educated people will not believe that you are a good physician if you have an unscreened dining room and kitchen. It is our duty not only to preach sanitation but to practice it.

We would like also to suggest that every physician make it his duty to at least once a month visit some school house and talk to the teacher and children about the condition of that particular building and help to develop in them a demand for better physical education.

Especially let us make the JOURNAL better. Remember that it is your JOURNAL. We expect to continue to publish every article that is sent in. This will take some whopping big editions in the early part of this year, but if you will read them, we will print them.

You are urged to read especially the advertising pages. Our advertisers are really conducting a post-graduate course for our profession, telling them about the newest and best things. We guarantee our advertising so you need not hesitate dealing with them for their advertised products.

SICK AND DEATH RATE FROM DIPHTHERIA TOO HIGH.

The State Board of Health is receiving official information from various cities in the United States to the effect that there is an unusually high incidence of diphtheria throughout the country, and reports received from County and City Health Officers in Kentucky would indicate that there is a corresponding higher morbidity from this disease than for any similar period in the past five years. From morbidity reports and estimates based on the total number of deaths, it is conservative to say that for the

months of October and November there were no less than 1800 cases in the State.

In view of these facts, it is important that physicians be urged to take advantage of the known measures to reduce the case incidence, and therefore lower the death rate. First, and most important, is prompt diagnosis and immediate use of antitoxin, and this is only possible where the physician takes cultures from the nose and throat of every case in the least suspicious, and while awaiting a laboratory report, to give antitoxin to the patient, and immunize the exposed children in the family. In the cases of diphtheria reported, it immediately becomes the duty of the Health Officer to establish a quarantine, and to continue same until two negative reports of cultures are made, and this important measure, together with the earnest cooperation of the family doctor, especially in first cases, usually will prevent a serious outbreak.

In the face of an enlightened public, already too critical of the profession, it is hard to understand why certain physicians continue to ignore the law, and fail to promptly report every case of infectious disease, and thereby give the Health Officer an opportunity to take steps for its control. Stubborn resistance to well known scientific facts, and careless disregard of the laws and rules of Public Health by a few careless members of our profession, constitute the chief cause for a continued high diphtheria mortality. Let every medical man in Kentucky criticise public officials only after he himself has done his full duty.

AN IMPORTANT DECISION.

Some months ago the readers of the JOURNAL were advised that one J. J. Pursley, alias "Dakota Jack" had been tried in the City Court of Middlesboro as an itinerant vender of patent medicines traveling with a troupe, and fined.

"Dakota Jack" secured able counsel and appealed the case to the Bell County Circuit Court. The *modus operandi* was as follows:

Pursley went to the town of Middlesboro with a troupe of musicians, gave a performance on a stand erected across the street from a drug store. At the conclusion of each performance he made a speech recommending his remedies and advised the audience that they might purchase same from the druggist across the street. The judge of the City Court held that this constituted an offense under the statute which forbids two or more persons traveling as a troupe and vending nostrums.

The Circuit Court of Bell County has just

sustained the opinion. The people of the State are to be congratulated upon the outcome of this case, and the Medical Referees will take due notice of same.

COUNCIL ENDORSES COUNTY HEALTH WORK.

In order to show that an all-time health officer and visiting nurse, depending only upon efficiency and tact, and upon results as shown by a lower sick and death rate, can secure the confidence, cooperation and gratitude of all of the people of a rapidly developing county, under almost inconceivable difficulties, the following is reproduced from the columns of the Harlan Enterprise of December 17th:

"At the last regular meeting of the Harlan City Council the following resolutions were adopted:

"Whereas, we now have in our city, men and women who are doing a public work, for the benefit and betterment of our citizens by trying to enforce the Laws and Rules of the State Board of Health, and wherein we endorse each and all of said Laws and Rules, we hereby request our police and judicial departments to cooperate with the County Health Bureau and its officials in the enforcement of said Laws and Rules, as though they were a part of our city ordinances. Signed:

HARLAN CITY COUNCIL.

By O. M. Hoskins, Clyde Rice, Charles Cole, W. F. Ball, G. T. Cawood, R. L. Ball, J. H. Blair.

Attest: W. M. Jones, City Clerk.

While this puts no new laws on our books, the above Laws and Rules of the State Board of Health already being in force as State laws, at the same time it increases our already favorable standing in health matters in the State and shows the rest of the counties of our State that we are justly claiming the foremost place in matters of Public Health.

Mr. J. B. Carter, City Attorney, stated to the Council that the legal aspects of these laws were sound and well tried, and expressed himself as believing such endorsement would be a boost, not only for the Health Bureau and its efforts, but also for the City itself, by displaying such progressive spirit.

Dr. E. M. Howard, Chairman of the local Health Board, was present at the meeting to express his convictions on the matter and he suggested that the laws and rules be adopted as a whole. He pointed out that as our city grows, much closer attention must be paid to sanitary arrangements to insure health for our people.

Dr. Ralph J. Malott and J. R. McCain,

Sanitary Inspector of the Public Health Bureau, were in attendance and read excerpts from the laws and answered what questions were put by the Councilmen.

DR. T. H. BAKER.

Dr. T. H. Baker, for two terms City Health officer of Louisville, is dead. For about a year he had been an invalid, and his death was a release from physical torture.

Dr. Baker had long been in the public eye—State Chairman of his party committee, Postmaster of Louisville, and its Health Officer, he discharged large civic duties and did them well. As a family physician for many years, he had one of the largest practices in Louisville. Everyone who knew him loved him and had confidence in him. He had a big, kind heart. His whole life was spent in service for and thought of others. It is good for such men as Dr. Baker to have lived, and his death leaves a vacancy that is hard to fill.

SCIENTIFIC EDITORIALS

SYPHILIS AND THE CENTRAL NERVOUS SYSTEM.

From the moment of infection to the last stages of syphilis the neurologist and psychiatrist is profoundly interested. The vast fields of possibility are opened and what will be the probable outcome no man can tell. That much syphilis could be prevented goes without saying. The only safe and sane method some will say is total sexual abstinence. Even to these we must say that such a procedure lessens syphilis, but does not altogether remove the risk, for one must not forget, *syphilis insontium*, syphilis of the "innocent", so called, possibly better denominated extra-genital syphilis, which is fairly frequent. So one may say that the uninfected are never free from the possibility of syphilitic infection, even though they do not indulge in sexual congress. And syphilis is ubiquitous in all countries, in all races and in every stratum of the social fabric. Nor is the infection of syphilis the result of libertinism, for as I have said before the "wise one" often escapes, the uninitiated often suffers. I have the record of a man's life that illustrates this. Born of healthy parents, possessing ample of this world's goods, this man was abstinent until age 19, at which time he married, lived a strict and virtuous life, knowing no other woman than she, who was his wife. Time turned and re-turned the sand glass of the years until forty passed. He was com-

pelled to be separated from his wife for some time and during this separation, unaccustomed to abstinence, he met a charming and supposedly uninfected woman who granted unto him certain favors, with the result that one, mistake or indiscretion, cost him dearly. Tragedy stalked forth and he acquired *both* gonorrhea and syphilis. Of the physical wreckage of an exemplary man, a loving husband and a good father little need be said, but these were as naught compared to the psychic torture that was, and is, his, even unto this day. And all genito-urinary specialists, neurologists and psychiatrists can duplicate this, perhaps many more times than I. And to those who say that men should follow lives of chastity, I would reply that it has never been and never will be, if we are to judge the future by the past.

Many cases of primary infection at the time of the *sore* and *secundines* experience the usual symptoms of a general infection, often ascribed to colds, tonsillitis, sore throat, etc., but in reality a response of the system to spirochetic infection. These cases always demand rigorous attention. As to whether we shall excise, cauterize or destroy the chancre, must be left to the decision of the attending physician as also the question of when shall we commence treatment, at once or wait as some deem best until the secondary stages and antibody formation has taken place. The vast preponderance of opinion to-day is, I believe, in favor of immediate, radical and intensive treatment. Much discussion centers around the value of the treatment to the patient, as to whether the early or later treatment is best. But here another factor enters and that is the relation of the syphilitic to the body politic. Most students of the mental attitude of freshly infected men will probably agree with the statement that after the first terror, horror and abject abasement wears off, the individual man or woman is apt to become reckless and not to care whom they infect. The one great advantage of immediate, intensive Salvarsan-Mercury treatment is the protection it gives to the uninfected. During the infective and early treatment the physician is called, as I see it, to perform one of his highest functions. Here is a fallow field for judicious counsel, the learning to psychologically face and meet the misfortune fairly and squarely; the inculcation and persistent treatment, these are demands that will tax the good Samaritan side of the physician, but if the right seed are sown in these early days, perhaps many, many crippling disorders and diseases of the nervous system would be avoided, that is prevented, for as has so often been said and written, the time to treat neural

syphilis is before it commences. We can thus see that the man who is first called upon to treat the infection of syphilis has devolving upon him a much heavier burden, as I view it, than the mere intelligent and systemic use of mercury and salvarsan. The man to-day who takes a case of syphilis and treats this case by a routine method of oral medication, who is satisfied with the writing of prescriptions for pills, powders or portions is in my humble judgment guilty of criminal malpractice. Medical science and humanitarian principles demand a better fate for our unfortunate brother. I agree with Frank Lydston that the man who invented the quarter grain pill of mercury proto-iodide should be entitled to the hottest chamber of Hades, or such similar fate. Let us then reiterate; in the hands of the physician who first treats the patient, frequently lies the future nervous and mental health of the patient. And let us hope that his medical conscience is so attuned to the good of mankind that he will not treat any such case unless he is *really* competent and able to do so by the latest and best of modern methods.

CURRAN POPE.

TWO INTERESTING AND INSTRUCTIVE CASES OF EMPYEMA.

During the recent epidemic of influenza we had two cases of empyema which were more than ordinarily interesting. The first was that of a boy aged 18 who had developed a complete consolidation of his left lung. He was running an uneventful course of pneumonia with pulse 120 to 130 and respirations about 40 when suddenly his pulse went up to 160, his respirations to 60, his temperature to 105, he became cyanotic and it seemed that his death was imminent. On examination his heart which had been in its normal position was found to extend about an inch and a half to the right of the sternum. On this evidence in connection with the marked increase in the severity of the clinical symptoms it was decided that he must have developed an empyema on top of his pneumonia. He was too sick to turn on his side for the purpose of locating the fluid and so with the help of novocaine a part of the sixth rib was resected in the anterior axillary line. When the pleura was opened only the solid lung was seen. No pus was evident. Feeling sure that pus was there somewhere we passed a large catheter between the lung and ribs and pushed it back watching the end to see when the pus was reached. When the catheter had entered eight inches the pus squirted out under high pressure and almost immediately the res-

pirations and pulse quieted down. The catheter was left in and the case treated from then on as an ordinary case of drained empyema would have been. This simple procedure undoubtedly saved this boy's life.

The other case is reported as a warning. As a left sided pneumonia was subsiding an empyema developed over the lower left lobe. Part of the sixth rib in the anterior axillary line was resected. The pleura seemed rather thick but without suspecting danger it was divided by inserting closed Mayo scissors and opening them. Some fatty tissue protruded and it was recognized that he had opened the abdominal cavity. It was closed with cat-gut stitches and an opening made an inch higher up into the empyema cavity. I was dumbfounded at the time but on thinking it over I explained the high position of the diaphragm as follows. During the course of the pneumonia the pleura had become adherent with the diaphragm in the expiratory position. When the pus developed the adhesions were strong enough so that the pus pushed upward instead of forcing the diaphragm down as is usual in such cases. This made the diaphragm leave the chest wall at nearly a right angle instead of at a very acute angle as is normal. In an ordinary case the incision as made would have been well above the insertion of the diaphragm.

R. H. COWLEY.

CIRCUMCISION.

After an observation of some twenty years I am convinced that there is far too little attention paid by the average physician to the subject of circumcision, both in the male and the female. We read in our text books and we have heard from our professors statements about the reflex irritation of the nervous system caused by the tight and adherent foreskin but from observation of hundreds of children and from questions put to parents it is evident that the average doctor does not even inspect the prepuce at birth to see if it is free and easily retracted. Any physician who has given this subject any considerable attention could cite many cases which would show beyond doubt that the most serious consequences may follow if a tight prepuce is left undisturbed. While not as important in the female as in the male it is still of tremendous importance, for there are many women who throughout their lives are excessively nervous, poorly developed and who show poor resistance to any shock, strain or infection which comes along and who on the most painstaking examination show no evidence of organic disease. That some at least of these cases are caused by a cryptic eli-

toris is entirely possible. I want to report a few cases which were very enlightening to me and the recital of which may excite the interest of others in this subject.

Case 1. Tommie Guinn, in the children's ward of the City Hospital of Cleveland, was three years old and weighed about 12 pounds. His skin was thin and transparent with no subcutaneous tissue. He would take no food other than his bottle and had never done so. He had a marked tuberculous of the spine with sharp angulation at the level of the first lumbar vertebra. When he came under my care I found almost by accident a tight prepuce and could feel underneath a ring of hard material which I could not account for. He was circumcised and the hard material was found to be calcified smegma. Almost immediately after the operation he began to eat ravenously and in two months he was as fat as a pig and his spine was apparently healed.

Case 2. John M., was a baby six months old and weighing the same as at birth. The only food he would take was milk poured over his two fingers which he sucked continuously. He was circumcised and under his tight prepuce was found a mass of dry smegma. Soon after the operation he began to eat as much as he could get and in two months he weighed several pounds more than the average for his age.

Case 3 was a girl seven years old who was pale, thin-skinned and delicate. She had taken all kinds of tonics under the direction of competent physicians but made no progress. When she was brought to me it was for the lack of any other possible solution that I advised giving her an anesthetic and examining her clitoris. It was found tightly adherent and on freeing it considerable smegma was removed. The improvement in this child was remarkable and as I meet her on the street, as I do almost daily, I am convinced by her robust healthy look that that simple procedure has made what would have been a nervous irritable female into a strong vigorous woman.

These cases could be multiplied indefinitely and they go to show that in the presence of a thin-skinned, undeveloped, irritable child where no other cause for the trouble can be located one must not abandon the case as hopeless till the foreskin has been examined and this applies as well to females as to males.

Every doctor should make it a routine to retract and clean the foreskin of every male child that comes into the world. Personally I believe in the old Jewish rite and advise cir-

cumcision in every case. Incidentally a long redundant foreskin predisposes to masturbation and sexual perversion.

R. H. COWLEY.

ORIGINAL ARTICLES.

RECENT DEVELOPMENTS IN CONTAGIOUS DISEASES.*

By JAMES W. BRUCE, Louisville

The field of contagious diseases is so broad that it is impossible to cover it in a paper of this length in more than a sketchy manner. These diseases are interesting to every doctor, from the pediatrician who sees more of them than any one else to the surgeon who lives in deadly fear lest they contaminate his operating room. They are of chief interest to the public health officer whose main object in life is warfare against contagion and prevention of its spread.

Although we have recognized contagious diseases as long as we have known anything about medicine, still 2 of the most common of them—measles and scarlet fever—remain of unknown etiology. When the great epidemic of measles swept through the Army camps in this country in 1917-18, leaving in its wake thousands of cases of a fatal form of bronchopneumonia, another effort was made to discover the cause of the disease in the hope of finding some specific form of prophylaxis or treatment. However, the attempt was unsuccessful and we are still as much in the dark as ever.^{1 2}

DIPHTHERIA

In diphtheria we have an entirely different proposition. Here the causative organism is known, it can be readily identified in the laboratory, and we have antitoxin which if given early enough and in sufficient dosage, will cure the disease in 100 per cent of cases. In spite of this we face a yearly mortality of over 10,000 persons in the U. S. registration areas and in Kentucky alone the average mortality for the past five years has been 416, which is 18.3 per cent of the total cases reported. The only acute diseases that have a higher mortality than this are pneumonia, meningitis, and possibly typhoid fever.

Why does such a mortality exist? The answer is unmistakable. Antitoxin is not given early enough or in large enough quantities. In order to stop the ravages of diphtheria the antitoxin must be given almost as soon as infection takes place, for once the

*Read before the Kentucky State Medical Association, Lexington, September 27, 28, 29, 30, 1920.

toxin has attached itself to nervous or muscular structures, the damage is done and all the antitoxin in the world can not dislodge it. The great danger in diphtheria is from the heart and nerve complications and after the fourth or fifth day and in virulent cases even after the 2nd or 3rd day, these structures may have been attacked and by that time antitoxin can only prevent further damage, but it can not heal the injury already inflicted. It is like calling the fire department after the fire has ruined the house. In a series of 1047 cases of diphtheria at the contagious department of the Boston City Hospital, 58 cases got antitoxin on the first day and not one died, giving a mortality of zero; 253 cases received antitoxin on the second day the mortality was 0.8 per cent; 239 cases received it on the 3rd day of the disease with a mortality of 5.8 per cent; 176 cases got it on the 4th day with a mortality of 9 per cent; and 110 cases on the fifth day, the mortality being 14 per cent. At this same hospital there have been 460 cases of diphtheria among the doctors, nurses, and employees since 1895 and there has not been a death, which is due unquestionably to the fact that antitoxin was administered in large doses at the outset of the attacks often before a membrane had formed.

Antitoxin should be given in an overwhelming dose just as soon as the clinical diagnosis is made and without waiting for the laboratory to confirm it. If we wait for the laboratory, we lose at least 24 to 36 valuable hours. This does not mean that we must not send a throat culture to the laboratory, for it is most important that we should in order to properly take care of contact cases, etc., but we must not wait for the report from the laboratory before we give antitoxin. We must not be afraid to give enough antitoxin. It is perfectly safe to give more than enough; no symptoms can arise from overdosage, but it is very dangerous not to give enough. Antitoxin is best administered in one big overwhelming dose. If the injection has to be repeated a second time, it is an admission that enough was not given the first time. Our purpose is to absolutely smother the toxin circulating in the blood, just as you would smother a fire with water. Cases of diphtheria of the pharynx and fauces, no matter how mild, should receive 18,000 to 24,000 units because the toxic absorption from this is so great and if there is much toxemia 48,000 to 75,000 units should be given. In the cases of laryngeal diphtheria the dosage need not be so large, because absorption of toxin is not so great and the danger is from

mechanical obstruction. 18,000 units will usually suffice in these cases.

It has been conclusively proven that antitoxin injected intravenously acts much more quickly than the same amount subcutaneously and therefore it should be used by this method in very toxic cases where quick action is necessary. The subcutaneous antitoxin is almost as effective, but it takes some time to be absorbed into the circulation and it is a great advantage in severe cases to overwhelm the circulating toxin all at one time with an intravenous injection. With the concentrated antitoxin such as can be gotten through the State Board of Health, the bulkiness of serum medication can be largely eliminated and thus a great difficulty in intravenous medication is avoided. With this preparation the doctor can give 1000 or 10,000 units of antitoxin and still use the same quantity of serum.

THE SCHICK TEST

In 1913 Schick first published the description of the phenomenon which has since borne his name and has been of such invaluable service in combatting diphtheria. He discovered that if a very minute quantity of diphtheria toxin is injected into the skin of a person susceptible to the disease, there results a local inflammatory reaction which is very characteristic in appearance and duration. This local inflammatory reaction is due to the destructive action of the diphtheria toxin on the skin of the individual. If, however, the person has sufficient antitoxin circulating in his blood, the injected toxin will have no effect at all and there will be no local inflammatory process. To prevent the appearance of the reaction according to Schick at least 1-3 of a unit of antitoxin per c.c. of blood is required. This amount he considers sufficient to protect against diphtheria.^{6 7}

The amount of toxin which Schick arbitrarily took to divide the susceptible from the immune is 1-50 of the minimal lethal dose of diphtheria toxin. The minimal lethal dose is the least amount of toxin which when injected into a 250 gm. guinea pig will kill it. It is also necessary when making this test to have a control inoculation, because many people are sensitive to the protein of which the toxin is composed. To make the control, the toxin is killed by heat and an identical quantity is injected into the skin. Any inflammatory reaction which occurs at the site of this injection is due to protein sensitization and is not a reaction to toxin because there is no toxin there. A more detailed description of these reactions and their differentiation will follow a short account of the technique of the test.

The materials for the test and full descrip-

tion of the method and its interpretation can be gotten from the State Board of Health or from any of the large commercial houses. It is necessary to have a syringe in which 0.2 c.c. can be accurately measured—the Luer 1 or 2 c.c. or the tuberculin syringe are satisfactory. Also the needle must be new and sharp and not have too long a point. The toxin and the control are first diluted so that 1-50 minimal lethal dose is contained in 0.2 c.c. of fluid. This quantity of each is then injected into the skin. Great care must be taken that this injection is made into the skin and not under it. The mouth of the needle should be so near the surface of the skin that it is visible. When properly made the injection stands up in a wheal making the sebaceous glands look like little pits.

The reactions may be classified as 1, true; 2, false, and 3, combined. The true reaction occurs at the site of the toxin inoculation. It consists of a circumscribed, indurated, inflammatory nodule which appears in 12 to 24 hours, reaches its greatest intensity in four days, and subsides in seven to ten days leaving a sealing pigmented macule which may remain for weeks or months. A strongly positive reaction at its height will measure 1-2 cm. in diameter. There is never any constitutional reaction such as fever. Reactions range from strongly positive to negative. Persons with strongly positive reactions are very likely to contract diphtheria if exposed, those with fairly positive reactions have a small amount of antitoxin in their circulations and may or may not become infected, while those with negative reactions practically never contract the disease no matter how close the contact. In support of this last statement Park showed that out of 1400 persons with negative Schicks in the contagious hospital of N. Y. City, not one developed diphtheria although all were exposed to it and 20 per cent became carriers of virulent diphtheria bacilli at some time during their stay in hospital.

The false reaction is due to sensitization of the individual to the protein of the toxin and not to the toxin itself. It rarely occurs in young children (4 per cent), but is more frequent in older children, and is found in 38 per cent of adults. It consists of an indurated inflammatory nodule not so sharply circumscribed as the true reaction, which reaches its height on the 2nd day and then recedes rapidly so that by the 4th day, when the true reaction is at its height, it has almost disappeared. It almost never scales or leaves a pigmented macule. It may occur at the site of inoculation of both toxin and control.

The combined reaction occurs where the

individual is both sensitive to the protein and has insufficient antitoxin to neutralize the toxin. It occurs only at the site of inoculation of the toxin and is always associated with a false reaction at the control. In these cases there is a reaction at both toxin and control; the control reaction has almost disappeared by the 4th day, however, while the toxin reaction reaches its height at this time and does not recede until the 7th to 10th day.

The following conclusions may be drawn:

1. Read the test every day for four days.
2. If there is no reaction about the toxin in four days, the test is negative.
3. If after two days there is no reaction about the toxin, it is likely to be negative.
4. If there is a reaction about the toxin and none about the control after two days, the test is positive.

The Schick test can be put to the following practical uses:

1. Epidemics of diphtheria. By this method the susceptibles can be separated from the immunes. The former can then be given prophylactic doses of antitoxin or if conditions are such that they can be closely watched and controlled, it is better to wait and see if the disease develops and then give a curative dose of antitoxin, in this way avoiding promiscuous sensitization to horse serum.

2. The Schick test can be used in the work of keeping diphtheria out of institutions, schools, etc. Under these circumstances where diphtheria is of sporadic occurrence and epidemics are greatly to be feared, all individuals should be classified by means of the Schick test as susceptible or immune and the former should be given active immunization with the toxin-antitoxin mixture as will be described later:

The following table shows the susceptibility to diphtheria by ages as determined by the Schick test:⁹

Age	Susceptible
Under 3 mos	15 per cent
3 to 6 mos	30 per cent
6 to 12 mos	60 per cent
1 to 2 years	70 per cent
2 to 3 years	60 per cent
3 to 5 years	40 per cent
5 to 10 years	30 per cent
10 to 20 years	20 per cent
Over 20 years	12 per cent

From this table it can be seen that immunity inherited from the mother rapidly disappears after 6 months, until during the see-

ond year of life, less than 30 per cent of infants are immune. From the second year on the immunity gradually increases until by the fifth year, 60 per cent of children are non-susceptible and by the twentieth year 82 per cent cannot contract the disease. The time of greatest danger, therefore, is from the 6th month to the 5th year and we know from our mortality tables that 77½ per cent of the deaths from diphtheria occur before the fifth year. Once the Schick test becomes negative showing immunity to diphtheria, it probably remains negative for the duration of life. It has only been used extensively for six years, so that is the limit of observation on it. Of course, this does not apply to the short-lived immunity following a dose of antitoxin or even of the disease itself. Following antitoxin the Schick becomes negative for a variable length of time depending upon the size of the dose, but this immunity is probably never permanent.^{10 11}

THE TOXIN-ANTITOXIN MIXTURE

There is a way, however, of actively immunizing individuals against diphtheria, which will confer immunity in practically 100 per cent of cases and so far as present observations go, this immunity is probably permanent. This is done with the toxin-antitoxin mixture which was first put to practical use in Germany by von Behring and in the U. S. by Park in 1914. The observations on this active immunization, of course, only last six years, but so far as they go, the immunity once conferred is never lost. This preparation, as the name implies, consists of a mixture of toxin and antitoxin, there being just a little excess of toxin over antitoxin so that the mixture is slightly toxic and the injections are occasionally followed by a little febrile reaction, but this is rare. It is given in 1 c.c. (15 min.) subcutaneous injections at weekly intervals for 3 doses. The immunity does not develop for at least a month and sometimes it takes several months, but in 6 months about 80 per cent are immune and in a year practically 100 per cent are immune. If antitoxin is given at the same time as the mixture, it hinders the development of immunity. This was illustrated by a series of 91 cases from an orphan asylum in which there was an epidemic of diphtheria and in which the toxin-antitoxin mixture and 750 units of antitoxin were given to the exposed cases at the same time. Only 46 per cent had developed immunity in three months. In a case of this kind the toxin-antitoxin should be repeated in two to three months giving the full three doses. In the same report, however, is a series of 150 cases that received toxin-anti-

toxin alone and in 2½ months the Schick test showed 94.6 per cent immune.²³

The slow development of immunity following these inoculations makes them of no use in combating epidemics, but its great value lies in immunizing the inmates of institutions and school children. Why should more than 10,000 people die in the U. S. every year from a preventable disease? If every infant were inoculated during the first year of life, it would have developed immunity by its second year when ordinarily it is so susceptible and would be in no danger from diphtheria probably for the rest of its life. Diphtheria has no right to exist when we have a weapon like this. The inoculations are given with a hypodermic needle subcutaneously in the arm or back and are followed by practically no reaction in infants although there may be a very slight reaction in adults. The reaction is due mostly to protein sensitization and occurs with the same frequency as the false reaction after the Schick test. The same dose is used for adults and infants. This method of active immunization has been used in numerous institutions e.g. orphan homes where epidemics and sporadic cases of diphtheria had occurred and where throat cultures and isolation of controls and carriers and prophylactic injections of antitoxin had been unable to stamp out the disease, but since the routine administration of toxin-antitoxin to all individuals admitted, there has been no more diphtheria. I think that every child should have these inoculations during its second six months.^{12 13 14}

WHOOPING COUGH

Two methods in the treatment of whooping-cough are being given a great deal of attention at the present time and are worthy of comment here. These are the use of: Benzyl benzoate as a cough sedative; Vaccine for prevention and cure.

Benzyl benzoate was discovered in the search for a drug which contained all the sedative and none of the narcotic properties of papavarine, one of the alkaloids of opium. The opium alkaloids are sharply divided into two groups: one group, of which morphine is the best known, has a stimulating action on involuntary muscle, while the second group, of which papavarine is the best known, has a sedative action on involuntary muscle. However, papavarine has too strong narcotic powers to be used in large enough doses to exert fully its sedative action. This led to experiments to discover an equally sedative and less toxic drug and benzyl benzoate is the result. It can be used in large doses without toxic effect and has been employed extensively

in the treatment of spasmodic affections of involuntary muscular structures e.g. dysentery, biliary colic, renal colic, dysmenorrhea, and bronchial asthma. Many favorable reports have been made relative to its use in these conditions. It has also been shown that it is sedative for voluntary muscle, although not to the same extent as for involuntary muscle.^{15 16 17}

In whooping cough we know that there is a catarrhal inflammation of the larynx and a hypersensitive condition of the nervous mechanism of the larynx so that spasmodic contraction is readily induced. The use of benzyl benzoate has been followed by remarkable claims for its efficiency as a cough sedative and those who advocate its use say that it fails to benefit only when used in insufficient dosage. It is prepared in a number of ways by the commercial houses. The simplest method is the 20 per cent solution in alcohol which may be given to children in five to fifteen drop doses in sugar water or milk. It is also put up in 5 minim globules.

Benzyl benzoate is an ester of benzyl alcohol and benzoic acid and is found in balsam of Peru and balsam of tolu. It is a clear, colorless, odorless liquid, with a disagreeable burning taste, insoluble in water and glycerine, and soluble in alcohol, ether, chloroform, and olive oil. If all the claims made for this drug are substantiated in practice, it will prove a wonderful addition to our pharmaceutical armamentarium.¹⁸

The use of vaccines in whooping cough may be divided into prophylactic and curative. It is well established that vaccines are of benefit in prophylaxis. They are given at two day intervals for three doses, $\frac{1}{2}$, 1, and 2 billion bacteria respectively. There is almost never any constitutional reaction after the injections, e.g. fever. Some very careful work has been done which goes to show that much better results are obtained with perfectly fresh vaccine (less than a week old) which contains no preservative. This author was able to demonstrate antibodies in the blood in 94 per cent of cases where perfectly fresh vaccine was used, while with vaccine two to four weeks old he found antibodies in only 25 to 75 per cent of cases, and with vaccine two to three months old even when large doses were used (up to two billion) he only got positive results in 12 per cent of cases. Of course, vaccine as fresh as this author used it impracticable as it can not be obtained in most cases, but the reports of prophylactic inoculation with stock vaccines are so favorable that it must do good even if antibodies can not be demonstrated in the blood,

just as we all know that a person may or may not have a positive Widal after typhoid fever, but he rarely has the disease a second time.^{19 20 21 22}

Opinion is divided about the curative use of vaccines. No one is really enthusiastic about their results and the common feeling is that they certainly do no harm and may do some good. It is generally believed that vaccines do most good when given in the catarrhal stage of the disease before the paroxysms have begun. The difficulty arises here of diagnosing between the catarrhal stage of whooping cough and ordinary bronchitis and I think it is good practice to give vaccines in any case of severe cough where there is an epidemic of pertussis or a history of exposure to it. The vaccine is commonly administered in four doses at two or three day intervals of $\frac{1}{2}$, 1, 2, and 4 billion bacteria respectively. What I have said refers to vaccine made of the bacilli of whooping cough alone. Many men say they get better results with a mixed vaccine, i.e., one containing the bacilli of whooping cough and also the most common secondary invaders of the upper respiratory tract, e. g., staphylococci, streptococci, influenza bacilli, etc. Personally I think the best results are obtainable in this way. It is impossible to say just how much good vaccines do in the treatment of whooping cough. Some men claim good results and some claim they get no effect at all. As long as they do no harm and there is a possibility of their doing some good, I think we should use them.

CONCLUSIONS—DIPHTHERIA

1. Antitoxin in large doses should be given to every case of diphtheria just as soon as the clinical diagnosis is made and without waiting for the laboratory diagnosis. In virulent cases it should be given intravenously.

2. The Schick test is valuable in separating those immune from those susceptible to diphtheria. A person with a negative Schick test will not contract diphtheria and need not receive antitoxin. The Schick test shows that the susceptibility to diphtheria is low in the first six months, after which it rapidly rises to its highest point at eighteen months and then gradually declines.

3. The toxin-antitoxin mixture will actively immunize against diphtheria in practically 100 per cent. of cases and should be given to all infants in the second six months of life.

WHOOPING COUGH

4. Vaccines are valuable in prophylaxis of whooping cough and probably do some good

in treatment especially when given in the catarrhal stage and in large doses.

5. Benzyl benzoate is a valuable cough sedative.

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DISCUSSION:

Arthur T. McCormack, Louisville: I am sure every member of the Association is very much gratified this morning at the arrangement of this entire program on diseases of children, and I know the profession of the state can congratulate itself that these leaders in studies in the diseases of children have come before them and talked about matters concerning which every single one of us is interested in our practice. I am sure the members of the profession, who treat children at all, will look forward to the publication of this paper and its intensive study with great interest.

It is gratifying to know that Squibb and Company, who provide us with our vaccine products at present, will have in our laboratory immediately the material for the Schick test and the toxin-antitoxin mixture, so that it will be available to you on the same terms as the other bacterial products we are handling, and you can make use of them in your own work. This work has been done at a very slight expense in Kentucky in a few of the schools by a few doctors. Its rapid extension is hoped for, because there is no question but that the immunization of chil-

dren from this dread disease will make a distinct advance. In this connection I want to urge the members of the profession of the state to assist us in handling this entire matter in educating the public as to the necessity for getting physicians early. The women's clubs, the Red Cross, and all other organizations with which we are allied are entering upon an extensive campaign to educate the people to call in doctors as soon as possible.

We cannot do that without your cooperation and the best argument we can make in favor of doing it is to have early and complete reports of the reportable diseases. If you will report them to your health officer, so that we can have adequate statistics, we will have no difficulty in securing their cooperation. With the card reports we are enabled to get results. As rapidly as card reports come into the health officer circulars are mailed to the family which contains those things we have learned about the prevention of the disease reported, and they tell the family why the doctor is all-important in that particular case. It helps to educate the people to appreciate scientific medicine, and I am sure it will be of the greatest advantage to the people of the state if diseases are reported promptly and these cases are handled efficiently.

Samuel E. Woody, Louisville: I was exceedingly interested in what Dr. Bruce said about the Schick test. It appealed to me strongly when it was first introduced, and I tried to use it at the first opportunity, but was unable to obtain it in Louisville. So I became discouraged and believed that it was not really practical for the general practitioner, as busy as we general practitioners are in Louisville now to make a living.

I advocate the intravenous method of administering diphtheria antitoxin, especially if the child is tractable and you have developed the necessary perfection of technic. It has the great advantage of economy in material and promptness of effects. We get more results from the antitoxin and much more promptly. Furthermore, there is no lingering pain at the site of the injection. The child ceases to complain, and it does not make much difference as to volume whether you give 5 c.c. or 50 c.c. to get the requisite amount of units.

J. D. Maguire, Lexington: The most excellent paper of Dr. Bruce did not go deeply enough into the subject to tell us the differential diagnosis between chicken pox and smallpox. That has been troubling me some recently.

I just returned from San Francisco where I attended the meeting of the American Public Health Association, and we discussed this question very fully. I saw some of the demonstrations there of the differential diagnosis between

chickenpox and smallpox—I mean the milder type of smallpox, and the method of diagnosis was rather novel. I discussed this question with two carloads of doctors who went from Chicago last week up into Seattle, Portland, and as far as British Columbia, and the opinions varied greatly in regard to the differential diagnosis between chickenpox and mild smallpox. I was very much surprised to learn at San Francisco their method of diagnosis. Their suggestion is that the patient be entirely disrobed and stand in a plain white light. You go up to the patient, you do not stand in the doorway as some of the doctors told me, and see if you can differentiate between smallpox or chicken pox. I have been especially endowed with some freckles, and this will help to demonstrate their method. There are two methods, the “closed method,” and the “open method” of diagnosis, and this is the closed method. If you can see these freckles on my arm (indicating) and imagine these to be pustules, with the arms crossed in this position (indicating) the fingers between the point of the shoulder and neck, with the face dropped forward and the chin as far down on the chest as you can get it, if you can see the pustules, it is smallpox. Smallpox is below the knee and on the feet. I said this method is the closed method. The open method is to extend the arms upward and face well back in this manner (indicating). When this is done the vesicles will appear on the inner side of the arm, on the face, and in the axilla. That seems to be the keynote of diagnosis by the open method. With the vesicles under the arm pit and around this part of the chest, it is chicken pox.

I bring this new idea to you. I am sorry I cannot tell you more about its accuracy because we have no smallpox in Lexington and but few cases of chicken pox, but it is a new idea. I have the pictures and a full description of the differential diagnosis between chicken pox and smallpox as recently issued by the California State Board of Health, and if any of you wish to see these pictures or read this description, I shall be pleased to show them to you.

J. W. Bruce, (Closing): I have nothing in particular to add except to mention the fact that the toxin and antitoxin mixture is not used in epidemics, because it takes several months for immunity to develop after the mixture has been given. It is no use in these cases at all. It is of the greatest use in orphan asylums or in in-

stitutions where there are children. I believe that every child ought to have this toxin and antitoxin mixture during the second six months of life, because it will then develop immunity and will not go through that period of greatest susceptibility, the first five years, when diphtheria is so common and fatal. It seems to me, if every child could get the toxin and antitoxin mixture in the first six months of life, we could stamp out diphtheria.

Samuel E. Woody, Louisville: I do not think it is a good thing to carry antitoxin around with you. It will deteriorate rapidly. I have recently had some distressing experience in that line and feel I want to impress this point. I go to the other end of town rather than trust an old antitoxin that had not been kept on ice.

SYPHILIS AND THE EYE.*

By **ADOLPH O. PFINGST**, Louisville.

When we consider that an average of 3.2 per cent of all cases of syphilis—acquired and congenital—are associated with some eye involvement; that 2 per cent of all eye diseases are of syphilitic origin and that from 14 to 15 per cent of the world's blind are caused by this disease, we can readily realize the importance of the subject which I have chosen for our consideration to-night. As these statistics are based on more cases recorded before, than after the introduction of the newer blood tests for lues and the more satisfactory knowledge of therapeutics, it may be assumed that the proportion of syphilitic eye affections is even greater than general figures would indicate.

The disease may involve any part of the eye and may do so directly (either primarily or through the blood stream) or by an extension of the syphilitic process from neighboring organs. According to Graenow's tables in Graefe-Saemisch System of Ophthalmology, 1904, lues affects the different parts of the eye in the following frequency; Uveal tract, which includes the iris, ciliary body and choroid, 43.2 per cent of all cases; optic nerve, 24 per cent; muscles 15.5 per cent; retina 6.3 per cent; cornea, 4.1 per cent; lachrymal ap-

*Read before the Jefferson County Medical Society.

paratus, 1-3 per cent; lids and conjunctiva, 1.1 per cent; orbit, 0.2 per cent; sclera, 0.1 per cent; leaving 4.2 per cent unaccounted for. According to the figures at my disposal it seems that in fifty per cent or more of the cases of ocular lues, both eyes are involved, this being especially true in the complicated diseases, such as; iris-choroiditis, chorio-retinitis, muscle paresis, etc. It occurs at all ages but by far the greatest number of eye cases complicating lues are found between the ages of 20 and 40. Two-thirds of the reported cases befell the male sex.

Although the eye and its appendages may be the site of the primary lesion in syphilis, in the great majority of cases of syphilis of the eye, this organ is the seat of a later manifestation of a general infection. Congenital lues is also frequently manifested in an involvement of some of the eye structures.

It is of course known to you that few syphilographers of to-day adhere strictly to the clinical classification of lues into the primary, secondary and tertiary stages, introduced by Ricord and universally adopted by the profession. A sharp line of distinction between these stages can not be drawn, as is evidenced in the fact that any of the lesions of syphilis may occur at any stage of the disease irrespective of the time removed from the primary infection.

It is now believed that during the period of incubation following the exposure to syphilis, lasting from 10 days to 3 months (usually from 3 to 4 weeks), the spirochetæ multiply and infect the organism by way of the blood and lymph streams, even before the chancre develops. By many it is believed that even the bone, viscera and nerve structures may be involved, as early as the disease becomes apparent in the formation of a chancre, but that it does not become manifest in these parts until later.

Following the appearance of the primary sore and the enlargement of neighboring lymphatic glands which occur soon after the chancre formation there is another period of quiescence, a second incubation period as it were, lasting from 6 to 7 weeks, when the various kinds of skin eruptions and the mucous patches in the mouth and throat make their appearance. With the passing of these symptoms, the spirochetæ apparently lie dormant again for a period varying from several months to 8 or 10 years or longer, before gummatous or so-called tertiary degenerative changes take place.

It is my purpose to-night to review the principal diseases of the eye as they occur in syphilis and point out their relative frequency, the distinguishing clinical features, where such

exist, and the response of each to treatment, without attempting a consideration of the individual disease. It has been my endeavor to take up the diseases as near as possible in the sequence in which they occur in the course of the syphilitic process.

Although cases in which the eye or its appendages furnished the seat of the primary sore are not common, yet quite a number of cases of the kind have been recorded since 1899, when the first case of the kind was reported by Fano. Chancre of the eye represents from 3 to 4 1-2 per cent of the extra genital chancres. Most of the reported cases were on the eye lids, either on the conjunctival or on the skin surface. Primary lesions have also been reported occurring on the bulbar conjunctiva, the cornea and the tear sac.

It is of interest to note that most of the cases of chancre of the eye lids were caused by kissing the eyes. A large number were reported in Russia where they were brought about by a pernicious practice still in vogue, of licking the eye to remove a foreign body. Wounds of the lids have at times been accidentally infected with soiled linens, etc., as is illustrated by a case which I saw a few years ago in which a young man whose eye lid had been injured in an automobile accident and who had stopped at a farm house for assistance. The good Samaritan who rendered first aid and who employed a soiled towel to cleanse the wound was evidently a syphilitic, for in due time a well defined chancre developed at the site of the skin lesion.

While my personal experience with primary syphilitic lesions of the eye is limited to the case just cited, it seems from the cases described that a chancre of the eye in the beginning resembles a chalazion, making the diagnosis difficult until induration and ulceration has taken place. In these cases there is, as a rule considerable conjunctival injection and chemosis. Within two or three weeks after the development of the chancre the neighboring lymphatic glands become enlarged those at the angle of the inferior maxilla when the chancre is situated near the inner canthus, and the preauricular glands when situated near the outer canthus. In its course and response to antisymphilitic treatment chancre of the eye does not differ from the condition elsewhere.

Very exceptionally lues in its advanced stages affects the eyelids.

After the infectious elements have become disseminated throughout the body, any portion of the eye, with the possible exception of the crystalline lens, may become the seat of localization, though the nveal tract is by far

most frequently involved, representing as was previously stated 43.2 per cent. of all syphilitic eye diseases.

The portion of the uveal tract which bears the brunt of syphilitic infection is the iris, although the choroid coat is not far behind in frequency of involvement. The etiological relation between syphilis and iritis has long been recognized and it is now believed that the percentage of cases whose etiology can be traced to syphilis is very high, having been variously placed from 40 to 75 per cent (average 61 per cent.)

Iritis is usually one of the early manifestations of constitutional syphilis, occurring as a rule within the first six months after the initial lesion. It occurs infrequently after the first year, although cases have been reported in which it appears many years after the receipt of the original infection. On the other hand it is not unusual for iritis to develop coincidently with the entaneous eruption, in fact a number of cases have been reported in which the iritis preceded the macular or papular syphilis. It is in those cases that appear early in the course of the disease that both eyes are frequently affected. While it is true that iritis appears as a bilateral affection in but 25 per cent of the syphilitic cases, the mere fact that iritis from other causes nearly always affects but one eye leads to the suspicion of a syphilitic cause whenever the disease appears as a bilateral affection. Iritis which occurs during the eruptive stage of syphilis is characterized by the formation of yellowish red nodules about the size of pin heads at the pupillary margin of the iris (iritis papulosa). This form of iritis suggests at once the nature of the infection. Other forms of iritis complicating syphilis, do not differ from the same disease of other origin. Their leucic origin may be assumed by the coincident presence of signs of lues elsewhere in the body and can be corroborated by the examination of the blood or the spinal fluid and by the favorable outcome of the eye disease following anti-syphilitic treatment. Most cases of iritis of syphilitic origin are of the plastic variety but they do not differ in their pathology and symptomatology from cases due to other causes. The serous type of iritis is very unusual in syphilis.

It is known that the iritis of syphilitic origin shows a much greater tendency to complications of the deeper eye structures than those of other causes, so that we find ciliary involvement the rule rather than the exception, and choroidal disease not uncommon in these cases.

Exceptionally the iris may become affected

in the advanced stage of syphilis and be the seat of gummatous formations. I believe that the cases of gumma of the iris are not altogether uncommon, though I have in my experience seen but five such cases. They appear as dirty yellowish bodies with reddish edges and are situated at the ciliary margin of the iris quite in contrast to the papules found at the pupillary margin of the iris in the cases of papular iritis occurring earlier in the disease.

Iritis may also occur in inherited lues, but in only a small proportion of cases and most of these coincidently to some other ocular affection (parenchymatous keratitis).

Iritis due solely to syphilis are more amenable to treatment and less prone to relapses after treatment is instituted than iritis of other causes.

Choroiditis is another frequent early manifestation of syphilis coming on usually within two years after the primary lesion. It occurs frequently during the course of iritis. Most of the types of choroiditis occurring as a primary disease are not, as was formerly supposed, due to lues but to other causes, primarily to focal infection. However, we see one variety of choroidal disease associated with retinal inflammations—diffuse chorioretinitis—which is caused by lues and whose presence is almost a certain sign of the disease. It occurs late in the course of lues, seldom before the second year and frequently much later. It occurs in both eyes and usually is found in those past 40 years of age. The retinal and choroidal changes are similar to late changes in the nervous system, the blood vessels undergoing a proliferation with coincident narrowing of their caliber. As a result of this in the eye, dust like opacity forms in the vitreous, at times small hemorrhages and finally atrophy and pigmentation of the retina. The vitreous cloud lasts for a long time and is necessarily accompanied by marked defect in vision. There is also a ring like defect in visual field as it is seen in retinitis pigmentosa.

Syphilitic inflammations of the retina are not uncommon, though they occur mostly coincident to choroiditis, cyclitis and iritis. Alexander has stated that 8 per cent of luetics develop retinitis. It seems that any of the various forms of retinal disease may occur in syphilis. As a rule they occur one or two years after infection and in most cases both eyes participate. The cases can not be differentiated from those due to other causes. However, Graefe described a type of retinitis which he believed to be peculiar to syphilis and which he called "Central relapsing retinitis." The affection occurs late in syphilis and is characterized by the sudden loss of

central vision, lasting several days and then returning to normal. There is a characteristic tendency to recurrence in such attacks.

As cases of choroiditis and retinitis are not as a rule diagnosed in their incipency, the administration of antisyphilitic therapeutic measures is also delayed, lessening the chances for recovery with retained normal function. Then in addition the fact that the most vital portions of the eye are involved in these diseases where inflammatory deposits readily cause destruction and distortion of the vital elements, accounts for the fact that antisyphilitic measures have not been followed by results as grateful as in the treatment of syphilis of the other eye structures.

The optic nerve is also a common seat of manifestation of lues, occurring as a rule two or more years after the primary lesion. Optic nerve lesions represent about 24 per cent of all luetic eye diseases. While they occur more frequently as bilateral affections, one nerve only may be the seat of the trouble. The primary affections of the nerve are practically all of an inflammatory nature. There is yet much doubt regarding the relation between syphilis and the simple non-inflammatory atrophies. These occur with such frequency in cerebro-spinal diseases, such as tabes and paresis, that most text books on ophthalmology (Fuchs, Roemer, DeSchweinitz) see in these so-called parasymphilitic diseases, especially in tabes, the chief cause of simple atrophy of the optic nerve. However as it is now believed that tabes and paresis are true syphilis of the cord and brain their close relationship to simple optic atrophy would make it appear that the affection of the optic nerve in its final analysis should also be attributed to syphilis.

Many of the inflammatory affections of the nerve are now believed to have their cause in the syphilitic infections. Even the cases of primary optic neuritis may be due to syphilis. Any portion of the nerve may be the seat of inflammation. When the intraocular portion alone is involved the papillitis is recognized with the ophthalmoscope by redness, some swelling of the disc, and blur of its edges. Cases of this kind subjected to early and proper treatment may recover with loss of little or no function, whereas neglected cases often terminate in atrophy of the nerve and blindness. It is not uncommon for the retina to be involved coincidently with the nerve, a condition then being spoken of as, neuro-retinitis. Most cases of inflammatory nerve involvement from a syphilitic cause are secondary to luetic manifestations further back (retro bulbar). The nerve itself may act

as the seat of a gummatous formation, or the gummatous process may extend from the brain or the meninges, or from the orbital walls. The ophthalmoscope in these cases reveals a papillitis or a well defined choked disc, evidenced by swelling of the disc, tortuosity and distension of the veins, smallness of the arteries and occasional hemorrhages in the retina. The swelling of the nerve is due to edema of the vaginal sheath, the lymph spaces around the optic nerve. These cases may also terminate in atrophy of the nerve, but with early treatment offer some hope of retained function.

Among the late manifestations of acquired syphilis of the eye, paralysis of the ocular muscles stand out preeminently. It has been shown that syphilis is the causal agent in the majority of cases of ocular palsies. While the frequency with which syphilis can be counted on as the casual agent in ocular muscle paralysis is uncertain, it has been variously placed by different authors from 17 to 60 per cent of all cases. Some place the rate even higher.

Ocular paralysis due to syphilis occurs as a rule very late in the disease, though it has been observed as early as six months after infection. Exceptionally it results from congenital syphilis. Both the extrinsic and intrinsic muscles may be involved.

It is interesting to note that paralysis of the third nerve in some or all of its branches represents almost 2-3 of the cases of ocular paralysis; the sixth nerve about 1-3, and the fourth only 3 per cent of the cases. The lesions occur either in the cortex, in the nuclei of origin upon the floor of the fourth ventricle, in the fibres connecting these two centers, or in the nerve trunks at the base of the brain, or in the orbit. The nuclear lesions are the result of a degenerative process due to syphilitic disease, while the lesions of the nerve trunks are nearly always the result of pressure of luetic affections of the orbit, the bony canal of the skull or the base of the brain, especially at the chiasm.

Recent reports of the treatment of ocular palsies of specific origin seem more favorable than former reports, for many cases have been reported in which satisfactory results have been obtained through early diagnosis and treatment. Unfortunately many of these cases present themselves for treatment after degenerative changes in the nerve structures have become extensive, so that even with proper and rapid treatment the paralysis remains permanent. This was exemplified in a recent case seen with Dr. C. H. Harris of this city, in which the patient did not apply for treatment until he had a deep sloughing ul-

cer of the tonsil, soft palate and complete involvement of the third nerve. This man was given salvarsan followed by mercurial injections, resulting in a rapid cure of his pharyngeal ulceration, but the ocular condition has remained unchanged.

In congenital syphilis, the eye may be the seat of manifestation of the disease, though very much less frequently than in acquired syphilis. We have in interstitial or parenchymatous keratitis an eye affection which may be looked upon as a strong indication of the presence of congenital lues. I need only remind you of the syndrome of interstitial keratitis, Hutchinson's teeth and deafness of central origin which Hutchinson looked upon as pathognomonic of congenital lues to impress this fact. Hutchinson believed that all cases of parenchymatous keratitis were due to inherited syphilis but present figures would indicate that only about 75 per cent of cases of interstitial corneal inflammation have their cause in congenital syphilis; some have placed the frequency as low as 6.5 per cent and others as high as 96.7 per cent of cases. It has been shown that 10 per cent of the cases are due to acquired syphilis in which they appear years after primary infection, and that a certain number are due to causes other than lues. As interstitial keratitis is one of the less frequent diseases of the eye, it represents but 4 per cent of the syphilitic eye diseases.

Interstitial keratitis is, as you know, a disease of childhood occurring mostly between the third and nineteenth year. In the specific forms it involves both eyes in 90 per cent of the cases, though not necessarily at the same time, whereas in the cases not due to lues, it is found in a unilateral affection in two-thirds of the cases.

Interstitial keratitis due to syphilis differs but little in its clinical course from the affection due to other causes. However, the presence of syphilis can usually be assumed owing to the characteristic symptoms of congenital syphilis so often recognized in these children, such as: dwarfed stature, peculiar characteristic conformation of face with low nasal bridge, scars at angles of mouth, Hutchinson teeth, deafness, etc. As a very high per cent of cases of congenital syphilis respond positively to the Wassermann test, the etiological relation between the eye affections and syphilis is conclusive.

We are all familiar with the fact that interstitial keratitis is frequently complicated with iritis, cyclitis and choroiditis; in fact most authors of to-day believe that some portion of the uveal tract is affected in every case of interstitial corneal inflammation and that the most extensive complications occur in

those due to lues. It is in these cases also, where after subsidence of the corneal disease, lesions of the choroid and retina are found with resulting permanent disturbance of function. Whereas interstitial keratitis always runs a slow course, it has been found that by the modern methods of treatment, the inflammatory stage could be shortened and that the cornea cleared and returned to near normal faster than in cases of a different etiology. Exceptionally the cause of other corneal affections can be traced to congenital syphilis.

In summarizing we find:

1. That primary syphilis of the eye which is not altogether uncommon, usually affects the conjunctiva of the eye lids and eye ball;

2. That at the time of the cutaneous eruption, the iris is a frequent seat of manifestation of the disease, as is also the rest of the uveal tract.

3. That in the long period between the eruption and gummatous formation, the uveal tract is involved early, in the first year or more and the optic nerves somewhat later, or sometimes many years after the infection.

4. That after this quiescent stage and the appearance of gummatous formations we have the lesions of the ocular muscles.

5. That in the one disease, which above all others occurs as a manifestation of congenital syphilis, the presence of lues can be demonstrated in about 75 per cent of cases.

6. We also learn that through early diagnosis of the syphilitic affections of the eye followed by prompt and energetic treatment, the prognosis in most of these cases is better than in former years.

DISCUSSION:

S. G. Dabney: One of the authorities Dr. Pfingst refers to, Alexander, has written a volume of considerable size on syphilis and the eye. This shows what a big subject Dr. Pfingst has undertaken in one evening's paper. I wish to congratulate him on the excellent summary he has made. Just a few remarks in addition: Dr. Pfingst did not refer to the case of late hereditary syphilis occurring in persons in the twenties or thirties or even at a later time; illustrating this, I may mention the case of a letter-carrier recently seen about thirty years old who had typical interstitial keratitis, typical Hutchinson teeth, and the typical scars about the face we see in inherited lues. His ocular condition improved rapidly under the use of Salvarsan and mixed treatment.

In regard to paralysis of ocular muscles we find two forms—the transient diplopia which often

precedes locomotor ataxia, and the constant and often long lasting paralysis either of an internal or external ocular muscle; this last form I have found resistant to treatment even when there was a distinct history of lues.

Sometimes the diagnosis of the congenital condition is best made by a provocative Wassermann.

When I first began to teach it was customary to say that sixty per cent of the cases of iritis were syphilitic, thirty per cent rheumatic, and ten per cent due to various causes such as diabetes—nowadays we have reduced the syphilitic proportion to forty or fifty, and are trying to substitute for the word "rheumatism" some more definite diagnosis—focal infections as suggested by Dr. Wolfe play a large part in this connection.

Herbert Bronner: Dr. Pfingst has given us a very timely and practical paper. We can realize the importance of this subject when we consider that three per cent of all syphilitics have involvement of the eye. We believe that it is highly essential that the ophthalmologist and syphilologist should work hand in hand in these cases in order that early diagnosis of eye lesions can be made and in order also that a check on treatment can be maintained.

We have seen several chancres of the eyelid, two of these were on the inner canthus, the others on the lower lid. Two of these cases had previously been diagnosed epithelioma. All of them responded promptly to anti-leucic treatment.

As Dr. Pfingst has already stated, iritis is very common, we see it often with the very earliest eruptions. It usually responds promptly to intensive treatment. The fact is that when syphilis and gonorrhea are eliminated as a cause for iritis it leaves very few cases for diagnosis. We have seen a few cases of gumma of the iris, they have all corresponded in appearance with the description given by Dr. Pfingst—dirty yellow little masses.

Disease of the choroid and retina is always serious. The prognosis depends on early diagnosis and intensive treatment and incidentally should always be guarded.

We wish to confirm what Dr. Pfingst has said about optic atrophy. So many cases of optic atrophy are just a phase of syphilitic disease of the central nervous system that it is essential to make a spinal puncture in all these cases. If the fluid be positive the patient should have the benefit of intraspinal treatment although other signs of tabes or other forms of syphilis of the central nervous system be absent. The favorable results of Fordyce, Ogilvie and Swift Ellis justify this procedure. Our results in ocular paralysis have, as a rule, been good. On the other hand, in interstitial keratitis the results have been variable. In some cases there has been a brilliant response to the arsenical preparations;

in other cases the disease has run a slow course as under the old line of treatment.

C. T. Wolfe: Dr. Pfingst has given us a very interesting resume of an exceedingly broad subject. He has left very little to be said but I should like to speak to one point.

He and Dr. Bronner place syphilis as the predominating cause of iritis to which I am sure we all agree but second in line of etiological factors I should place focal infection instead of gonorrhea, although I am aware that the gonococcus can play this role also. However the teeth, tonsils, sinus and alimentary tract, I believe, exceed it in many instances.

It is the opinion of the essayist that optic atrophy is usually a secondary condition of syphilis in other parts of the body. In tabes it may precede all other symptoms by several years, a fact which is of considerable diagnostic importance, although it is usually observed in the ataxic and paralytic stage.

A. O. Pfingst, (in closing): I have just a few words to say in closing. The most interesting feature that was brought to my notice in looking up this subject was that iritis occurs in syphilis as a bilateral affection in only 25 per cent of the cases. I have always been under the impression that this percentage was much higher, for many of the cases of iritis accompanying syphilis that came under my observation affected both eyes.

Regarding Dr. Hoffman's question relative to the occurrence of iritis as a result of intensive treatment for syphilis, I would say that the use of salvarsan evidently liberates spirochætae or their toxins and that they cause an active trouble in the iris. It can be explained on the same principal that the Wasserman test after the provocative use of salvarsan becomes more positive. I take it that Dr. Hoffman's cases occurred early in the treatment of syphilis when the first salvarsan injection stirred up the spirochætae to activity.

Regarding the question of the effect of salvarsan upon the eye, I would say that it is now considered safe to use it in any ocular disease, even in inflammatory conditions of the nerve.

It is now believed that those cases of optic neuritis occurring in syphilitic subjects following treatment with salvarsan are due to the liberated spirochætae and not to the therapeutic agent. The nerve involvement can be avoided by administering mercury before the salvarsan or coincidentally with it.

A CLINICAL NOTE ON HEMORRHAGE IN OPERATIVE TREATMENT OF FIBROID TUMORS OF THE UTERUS.*

By LEWIS S. McMURTRY, Louisville.

Fibroid tumors of the uterus are very common. In the latest text-book on Gynecology, the author, (Graves), states that 40 per cent of women have uterine fibroids. Mr. Bland Sutton says the great frequency of these tumors is not appreciated by surgeons who do not frequent the dead-house; in many instances they are found post-mortem in cases wherein their presence was not suspected during life. These tumors are never found before puberty; rarely before twenty-five, and the maximum of prevalence is between the thirty-fifth and forty-fifth years. It will be noted that their origin and growth are coincident with the child-bearing era. It is doubtful if a fibroid ever developed after the menopause.

Fibroid tumors are similar in structure to the tissues of the uterine wall. They are composed of interlacing bundles of fibrous tissue and unstripped muscular fibres. The proportion of each varies in different tumors, and to designate the preponderance of fibrous or muscular tissue the terms fibro-myoma and myo-fibroma are used. However, these terms, and the terms fibroma and myoma are applied indiscriminately to these growths.

The uterus is a muscular organ. The mucous membrane (the endometrium) is so continuous with the muscular walls of the uterus that a line of demarkation cannot be found. Likewise with the serous membrane (the peritoneum) covering the uterus. All uterine fibroids originate from the muscular structures of the uterus, and as to their origin and growth they are designated as (1) interstitial (2) submucous, and (3) subserous. It is not uncommon that two, or even all three of these varieties are associated in the same uterus. They often originate in the muscular tissue of the broad ligament; they may occur in any part of the uterus, but rarely in the cervix.

These tumors are usually multiple, varying in size from that of a pea to huge masses which fill the pelvic and abdominal cavities. They are often irregular in contour, and many fantastic forms occur. The heaviest fibroid on record weighed 140 pounds.

The consistency and elasticity of the tumor vary in accordance with the preponderance of fibroid or muscular tissue. The

fibroid (composed almost wholly of fibrous tissue) are firm and not highly vascularized. Indeed they usually receive their blood-supply indirectly from the surrounding dense musculature called the capsule. The softer tumors embraced in this class, composed almost entirely of muscular tissue (properly called myomata) are richly supplied with blood-vessels. On transverse section they resemble erectile tumors. Virchow designated them *cavernous myomata*. The vessels are for the most part venous, and are of large calibre.

When a sub-peritoneal fibroid develops on the lateral border of the uterus above the cervico-corporeal junction and grows between the layers of the broad ligament, it is termed intra-ligamentary; when the tumor springs from the posterior wall of the cervix and grows behind the peritoneum of Douglas' cul-de-sac, it is known as retro-peritoneal.

The operative treatment of uterine fibroids is one of the most brilliant chapters in modern surgery. The operations applied are myomectomy and hysteromyomectomy, selected in accordance with the number and character of the tumors. The mortality in skilled hands is less than four per cent, and few surgical procedures of equal gravity are followed by so few untoward sequelae or complications. The relief is complete and permanent. The operation as illustrated by a subserous tumor of moderate size, without adhesions or complications, is a procedure of ease and simplicity. When the tumor is intra-ligamentary or retro-peritoneal, or complicated by infected tubes, or the tumor itself infected, the operation will be one of the most difficult in all surgery. With the soft myomata, of great vascularity as already described, with firm visceral attachments, death from hemorrhage, often quickly, is not unknown even in this day of perfected technique.

There is such a thing as an inoperable fibroid tumor, (by the abdominal route) without regard to the skill and experience of the operator. Residing in this city is a woman, who has been in my professional care for eight years, the subject of an inoperable fibroma. The tumor is of extensive, though moderate, size, occupying a great part of the pelvis and lower abdomen; is retro-peritoneal and of preponderant fibroid character. I opened the abdomen and found the tumor to be retro-peritoneal; the intestines and bladder are in front of the growth, and to remove it would necessitate such extensive traumatism of the mesentery, and consequent intestinal resection as to render the condition practically inoperable. Certainly in the absence of any malignant complica-

*Read before the Jefferson County Medical Society.

tion or obstruction, a radical operation would be ill-advised. I closed the abdomen without disturbing the tumor in any way. In this case menorrhagia was never present, and the pressure symptoms were not conspicuous. The patient is a vigorous woman, possessed of energy and endurance, and has done remarkably well despite this handicap. She does all the housework of her family consisting of husband and son besides herself. During the current year she passed the menopause, and can be reasonably assured that the tumor will not increase in size. If the tumor were of moderate size and of the non-vascular (fibroid) type, operation by the vaginal route as practiced by Pean, Richelot and Segond would be applicable. If the tumor were of the vascular (myoma) type, and accompanied by hemorrhage, it should be treated with the Roentgen ray and radium.

The special purpose of this paper is to briefly consider the arrest and control of hemorrhage in the operative treatment of fibroid tumors of the uterus. I have already alluded to the great vascularity of the soft tumors, which Virchow designated cavernous myomata. I doubt not every surgeon with extensive experience in this operation can recall to mind the picture of an ovoid tumor filling the pelvis and in the midst of the operation venous blood welling up around the entire periphery of the tumor. To find and secure the bleeding vessel with the tumor *in situ* is at times impossible: to pack gauze behind and beneath the tumor will sometimes fail to control until the tumor has been removed and access is free to the floor of the pelvis. In the meantime the loss of blood may have become irreparable. Few conditions presenting in the course of abdominal operations test the surgeon's judgment and self-control in the same degree as this.

That this peril has not been altogether eliminated from this operation, notwithstanding the refinements of technique which approach perfection, can be attested by the following incident. During the past two years a friend of mine in a distant city, a teacher and hospital surgeon of skill and wide experience, operated in a case of uterine myoma under somewhat exceptional circumstances. The patient was a young married woman of prominent social position, a great favorite in a wide circle of friends, and desired to be relieved of the tumor without any publicity whatever. Indeed she insisted that it should not be known to any outside her immediate family that she was going to the hospital, or was to subject herself to any surgical treatment. This aversion to publicity is not uncommon, and can scarcely

be regarded as unreasonable; in this instance the surgeon very properly observed the patient's wishes punctiliously. The tumor was not of large size, but was the cause of profuse menorrhagia and nagging pressure symptoms. The surgeon had operated in hundreds of similar cases, and naturally gave the patient assurance of prompt and perfect recovery. During the operation such hemorrhage as I have just described occurred. The blood welled up from the deep pelvis, and despite every facility afforded by a completely equipped operating-room and trained assistants, the loss of blood was so great that the patient succumbed in a few hours. The surgeon told me that he was never able to find the mouth of the vessel from which the hemorrhage came. Considering the exceptional circumstances, I have recited under which this operation was done, one can appreciate the distress and humiliation of a conscientious surgeon, despite the fact that he had done his duty in the fullest respect.

It was with a view to successfully cope with this formidable complication which may sometimes arise unexpectedly in the course of hysteromyomectomy that I report the following case:

On April 24, 1920, Mrs. S., came into my care, having been referred by her family physician, Dr. Howard, of Harlan, Ky. Age 42, mother of five children, oldest 23, youngest 6; general nutrition fair, has had uniformly good health; the usual preoperative examinations disclosed no abnormal systemic condition. Menstruation had always been regular and painless until two years ago when it became profuse, and of late recurs earlier and continues longer than formerly. The evidences of loss of blood were marked. Six years ago she noticed a "lump" in the left lower quadrant of the abdomen, which has steadily grown and now presents itself as an abdominal tumor, rising to the level of the umbilicus and distinctly on the left side. Vaginal examination determined the presence of a firm, elastic growth filling the deep pelvis, and, also the unity of the tumor. The tumor was immobile. The uterus could be outlined, and was pressed well over to the right side of the pelvis.

Operation was performed on April 26th, 1920. The abdominal incision extended from the pubes somewhat above the umbilicus. The tumor occupied the entire left side of pelvis and extended above the pelvic brim. It required the briefest manipulation to show that it was a fibromyoma of the left broad ligament, and growing beneath the peritoneum. Broad ligament tumors of this character are sometimes originally uterine;

being subserous and pedunculated, they grow between the double peritoneal fold of the broad ligament and live by imbibition as the pedicle becomes attenuated. As a rule, however, they originate in the muscular structure of the broad ligament itself. The tumor was softer than the typical fibro-myoma, being composed almost wholly of muscular tissue (myoma), and very vascular. Large venous sinuses covered over the surface of the tumor and traversed its structure throughout.

The right ovary was cystic, with hydro-salpinx, and I removed both tubes and ovary. The left ovary and tube were normal and were preserved. To remove the tumor it was necessary first to secure the left ovarian artery and vein; a clamp was then applied to uterine attachment of the broad ligament. The peritoneum was then divided and separated from the exposed surface of the tumor, and the enucleation continued into the deep pelvis encompassing the entire growth. The tumor was ovoid in shape, and about as large as a coconut. As the enucleation proceeded into the deep pelvis, the ureter was identified and carefully stripped from the tumor with gauze; numerous small vessels were encountered and two veins were ligatured. After the tumor was removed there was considerable oozing but apparently no active hemorrhage. I placed a flat gauze pad in the bed of the tumor, and pressed it firmly in place. The broad ligament attachment to the uterus was secured and sutured over, the right pedicle examined, also the appendix, and then the gauze pad was removed preparatory to closing the abdomen. As the pad was withdrawn from the deep pelvis where the tumor had been imbedded there appeared a copious venous hemorrhage. The blood filled the pelvis quickly, and, the effect upon the pulse and appearance of the patient brought warning from the anesthetist. I packed firmly with gauze, and as my assistant withdrew the pack, I endeavored to find and secure the vessel. This manœuvre done once convinced me that the inferior mesenteric vein on the left side was opened, and previous experience had proved to me that when a vein is thus injured while upon the stretch, its mouth retracts beneath the superficial tissues so that it is practically impossible to seize it with haemostatic forceps. I immediately packed the deep pelvis at the point of bleeding, with two pieces of gauze, each 36 inches long and 12 inches wide. I packed firmly, the bones of the pelvis posteriorly affording a firm wall for pressure. This controlled the hemorrhage. I then put the intestines and omentum in place, and hurriedly closed the abdomen with through-and-through sutures of silk-work gut. The two

gauze pads were packed firmly in the left lower pelvis, and the abdomen closed completely without drainage.

The hemorrhage though of brief duration was shocking in its results. When the operation was completed the pulse could barely be detected at the wrist—a mere thread, rapid and feeble. The patient was blanched and presented the picture of exsanguination from hemorrhage. Hypodermoclysis had been promptly begun and was used freely; pituitrin was administered hypodermically. The patient was put to bed with the foot of the bed elevated; warmth was applied to the surface of the body, and proctoclysis was instituted.

I will not detail the clinical record from day to day, but will epitomize the further history of the case. The operation was done on April 26th, at 10:00 A. M. As already stated the patient was put to bed in profound shock from hemorrhage. At that time the pulse was barely perceptible. In a few hours a slight improvement in the pulse and capillary circulation was noted, and the temperature rose to normal. At 6:00 P. M. the pulse could be counted—148—and the general appearance of the patient was improved. Fortunately the patient escaped nausea and vomiting.

The following morning, April 27th, the pulse was 144 and much improved in quality; the temperature was 99.4, and the patient conscious. Water in small quantity was given by the mouth and retained.

On April 28th improvement was marked; pulse 132, temperature 100; general condition improved; taking water freely by mouth. Proctoclysis discontinued.

April 29th, pulse 124, temperature 99.5; general condition decidedly improved, bowels moved in response to enemata. At 10:00 A. M., (beginning of fourth day after operation) patient was taken to operating-room; under gas anesthesia the three lower stitches of the abdominal incision were cut and abdomen reopened. Pushing aside omentum and intestines, the two gauze strips were gently and slowly withdrawn. A quantity of blood-clot and some fresh blood followed, and a single gauze pad was packed into the posterior pelvis at the same site as former packing. The amount of fresh blood was not large, but was sufficient to make a marked impression on the patient. The end of the gauze pad was brought out the lower angle of the incision, and a single silk-worm gut suture was inserted to close the incision down to the gauze. The patient was put to bed in fair condition, but perceptibly weakened by this procedure. The treatment previously applied,

and described above, was repeated; in a few hours the patient showed marked improvement.

April 30th, pulse 124, temperature 99.4, general condition good; patient taking water freely by mouth. Proctoclysis was discontinued.

May 1st: Pulse 120, temperature 99, patient received and retained nourishment; bowels moved in response to an enema.

May 2nd: Pulse 116, temperature 99, general condition good.

May 3rd: Pulse 108, temperature 98.6, convalescence established.

May 4th: In my absence from the city, Dr. C. G. Arnold kindly attended, and (at my suggestion in advance) removed a part of the gauze extruding from the lower angle of the incision. This was done without detriment to the patient's condition.

May 5th: I removed the remainder (the greater part) of the gauze, accompanied with a large quantity of dark disintegrated blood clot. This was accomplished without much pain, and without any shock. The open angle of the incision was brought together with adhesive, free opening being left for drainage. From this time on I gave daily personal attention to dressing the incision, and am pleased to say that no infection occurred.

On May 7th the sutures (silk-worm gut) were removed; the incision had healed by primary union down to the lower angle where the gauze was placed. There was free drainage of disintegrated blood clot and serum.

From this time the patient's recovery was prompt and uninterrupted. At the end of the fourth week she returned home. The healing of the abdominal incision was perfect; the union of muscular structures being firm and continuous throughout. A recent letter from the patient, written four months after operation, attests her perfect recovery, with the statement that she is doing her household work without fatigue or discomfort.

So far as I am aware, the method adopted in this case to arrest hemorrhage in the abdomen by gauze packing and complete closure of the abdomen, without drainage, has never been done heretofore. I am encouraged to believe that if promptly applied, when in the course of hysterectomy or hysteromyomectomy a vessel is injured in the deep pelvis, some lives will be saved by this procedure which otherwise will be lost.

I bring this report to the notice of the profession with the hope that some mariner, sailing this uncharted sea, may hereby find a harbor of safety when his bark strikes the rocks which beset his course.

DISCUSSION:

Irvin Abell: In the removal of myofibromata which involve the uterine fundus hemorrhage is easily controlled by the usual methods. Where the uterine corpus is involved, and the tumor occupies the entire pelvic cavity, where veins coursing over the tumor are tremendous in size, the operation is more dangerous and greater surgical skill is required in the control of hemorrhage. In cervical myofibromata, which are usually sessile, bisecting the uterus and applying forceps upon either half, will control the hemorrhage. Where myofibromata extend laterally into the broad ligament, particularly if pre-existing inflammatory disease has caused adhesions, the control of hemorrhage may be exceedingly difficult, and those of us who have encountered such distressing cases will not soon forget them.

The procedure which Dr. McMurtry has suggested for controlling hemorrhage in the latter type of cases, i.e., closing the abdominal incision over gauze packing, is entirely new so far as my knowledge goes. The customary procedure of packing the cavity with gauze which is allowed to protrude from the lower angle of the wound, usually means subsequent infection which may destroy life or cause adhesions, or hernia requiring another surgical operation.

The idea of packing the cavity with gauze to control hemorrhage, closing the abdominal incision to avoid infection or hernia, subsequently reopening the lower portion of the wound to remove the packing, is unquestionably a useful procedure in cases such as the essayist has described, and I am greatly indebted to him for the suggestion.

C. G. Arnold: In the case reported Dr. McMurtry ordered the gauze removed at the end of three days. Personally I believe it should have been left for a longer period. When gauze is removed too soon oozing recurs as happened in this case. If the packing had been left intact for five or six days there would probably have been no further bleeding.

Undoubtedly the patient's life was saved by the procedure which Dr. McMurtry adopted.

B. F. Zimmermann: The essayist has said that some might regard the procedure he devised as unsurgical. The hemorrhage being venous in character, certainly no harm could come from packing the cavity with sterile gauze, and if left intact a sufficient length of time bleeding should be controlled. The results demonstrated that the procedure was eminently surgical.

L. S. McMurtry, (closing): The hemorrhage in broad ligament tumors is venous in character as a rule, the tumor must be enucleated from beneath the peritoneum or from between the layers of the broad ligament, and when put on the stretch the vessels are torn and quickly retract,

making it difficult to seize them with hemostatic forceps. Under such circumstances instead of wasting time and allowing the bleeding to continue, it would seem wise to proceed as I did in the case reported and control the hemorrhage by packing.

As to closing the abdominal incision over the gauze packing: In this particular case, the intestine and omentum being anterior to the tumor, I was impressed with the fact that if the gauze were allowed to protrude from the lower angle of the wound future hernia would probably be unavoidable, and the additional danger of infection had to be considered. Therefore, I decided to control the hemorrhage by packing and close the abdomen, thereby avoiding the danger of infection and subsequent hernia. The result happily confirmed all our expectations.

A CASE SHOWING ENDOCRINAL DISTURBANCE*

By CURRAN POPE, Louisville.

Of the importance of endocrinologic knowledge in medicine, neurology and psychiatry, there are few at the present time who would make denial. For many years the profession refused the patent facts and even today it is still in a sense the "step child" of internal medicine and neurology, so much so that it often has to bear the opprobrium of being a "fanciful and far fetched" endeavor to explain certain bodily, neural and psychiatric phenomena. To-day another era is dawning; we are beginning to realize the enormous import of the physiological and developmental influence of these internal secretions and their power to develop and mould us in many directions—of the power of pathological processes to change the "even tenor of our way". Many of these processes work through endocrinological channels. With this brief prelude I shall here report a case that to me possesses some very interesting features. In the very brief period of time allotted to me, I can only touch the periphery, as it were, for such a case is intricate, its endocrinological disturbances so interwoven as to make it almost impossible to do otherwise than outline the predominating gland influence. I cannot pause to touch upon or discuss the question of mono- or pluriglandular effects, but will limit myself to pointing out a few of the many interesting secretory disturbances present.

The patient, a boy, is aged 15. His father is a medium built, slender, blondish man, very active and would be classified as high strung,

intensive. His forbears were like him, his descent being rather on paternal than maternal lines. The mother is good sized, large boned, well built, strong, healthy, energetic and well balanced. She has had no miscarriages, and has borne three sons, the youngest our case. The older boy is well grown, normal, well educated, a professional man and succeeding in his work, which requires the expenditure of considerable bodily and psychic energy. The second son is likewise well developed, mentally and physically; played on a football team at college, took honors and is now engaged actively in an active profession and making good. The environmental influences have always been of the best. The father has always made an excellent competence, and has given his family all the necessities and luxuries that go with the American family, having educated his boys well and started them in their profes-

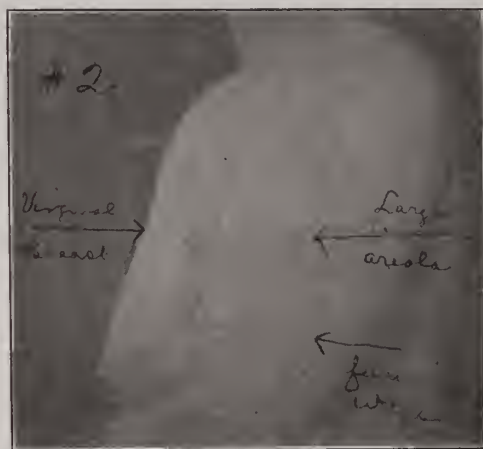


sional careers. There has been little or no friction in the household, all professing and living up to the higher ethical and Christian ideals of the community in which they live. It will thus be seen that heredity and environment, two most potent factors, can be ruled out in this case. During the period of gestation nothing adventitious was noticed, the

*Read before the Jefferson County Medical Society.

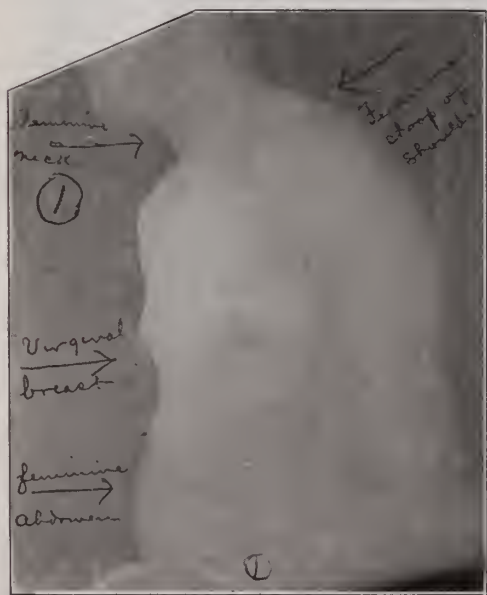
child being born at term after a normal, short labor. He was healthy in every respect, was breast fed, ate, slept and passed his infantile years without anything to make or mar his development. As he grew, he became a strong chap, fond of play, bright, industrious, well liked by his companions and by those elders with whom he came in contact. He had measles, mumps, chicken pox and has been successfully vaccinated twice without any complications or the development of any sequela of moment. In September, 1918, he suffered from a very severe attack of influenza, followed by a purulent appendicitis in the latter part of October, 1918. He was removed from his home to a hospital and during this trip the appendix ruptured; nevertheless he was operated upon and though he nearly died at this time, he survived and slowly rallied. It was a desperate chance for life in which surgery triumphed. He remained in the hospital four or five weeks, intensely toxic, the wound draining pus all the time, and giving no indication of healing. In December he began to take up school studies. On the 20th, (1918) while studying at a table and shortly after supper, he was suddenly struck (just like the blow from a fist) with a violent pain in the head and rapidly grew unconscious; he then began to vomit, and this

ing this time. He seemed slowly to recover consciousness, the first thing noted being the opening of his eyes for short periods, with slight jerkings of the left arm and leg. As consciousness increased he became able to take nourishment, swallowing with difficulty. During this time his temperature ranged from



100 degrees F. to 101.2 degrees F., his pulse being slow, often as low as thirty-six per minute, but full, strong, hard. At this time a neurologist was called in and pronounced the case one of cerebral embolism. He had developed a large bed sore from his decubitus, and this together with his suppurating burn and discharging appendiceal wound kept him in a profound state of toxemia. For a month his condition varied; now up, now down. His left eye had become red and bloodshot, he was greatly emaciated, petulant, nervous, erratic and generally upset, a not unreasonable or unexpected condition. This continued until the latter part of January, 1919.

At this time his pulse became very small, rapid, irritable and variable, often rising and remaining at 120 for hours. No improvement seemed to take place until the latter part of April, 1919, when he suddenly began to improve, began to eat, and take on flesh. As the nutrition improved, the burn promptly healed, then the bed sore and a little later the appendiceal sinus ceased its discharge, to later close. It was noticed at this time that with all of this handicap he had grown 2 1-2 inches, but was still the lean and hungry Cassius. He gradually regained his strength, grew fatter, sat up, walked and finally by September, 1919, one year later was strong and able to drive the family "Henry." The pulse was still irritable. Physically he had become large, coarse, fat and his entire nature had changed. From being an orderly, clean, neat boy, fond of dress, especially



kept up about every fifteen minutes for two hours, he remained unconscious for 15 days, was unable to open both eyelids and had to be catheterized. During this period of unconsciousness, he seemed unable to move his lower limbs and lost sensation in them. One leg was burned from the hot water bottle dur-

collars and ties, cheerful, pleasant, a fairly good mixer and reasonably truthful, he had become careless, slovenly, often dirty, did not care for dress, was noisy, erratic, irritable, frequently profane, and very abusive (in a way) of his parents, jeering them, crossing and contradicting them on every occasion; he was not only seen, but heard. This irritable phase lasted until November, 1919, when it was noted that his veracity became very bad, his memory treacherous, his habits and disposition more aggravated and now he began to sleep, all night, on every opportunity during the day. He complained of no pain no discomfort, no headache, had a sense of well being, and began to eat ravenously and to micturate frequently. He was able to at-



tend school and was excellent while actively engaged in school work, but cannot remember by afternoon what he had learned in the morning. His deportment was exorable and of the unruly, impudent and self-assertive type. He cannot pass a monthly examination of even the simpler facts of knowledge gained during the month previous. He now became a hedonist, seeking pleasure at all cost and becoming a constant devotee to the movies, this was obtained even if he had to disregard the ethical and legally recognized property rights of *meum* and *teum*. He became very loquacious, loud mouthed, ugly, quarrelsome and profane.

He wanted money, but often gave it away to others, would take things, sell them and carelessly throw a handful of small change to a crowd of small boys to see them scramble and fight for the silver and copper. During his illness he received all forms of medication (except physio-therapeutic and endocrinological) from appetizers to vaccines. I saw him in March, 1920, obtaining the foregoing history.

My examination of him physically showed a large overgrown boy, fat, nutrition fair, 5 feet 6 inches in height, weighing 165 pounds. His complexion clear, rosy and the skin clean with the exception of a moderate number of papules of *acne indurata* and *vulgaris*. The skin of the trunk and extremities is clean, fair and free from eruption. The perspiration is largely limited to the flexures, is foul and seems to destroy fabrics, especially in contact with the armpits and genitalia. It is not ex-

cessive in amount, save on exertion. The tongue is pale, pink, fairly clean, moist and firm, no tremor. The middle incisors are not spaced, there are several that are slightly carious, but all are heavy, square, strong and clean; some gingivitis but no pyorrhea. The pupils are medium in size, equal, react normally both to light and accommodation; the retinæ are negative, this being later confirmed by an ophthalmologist. The gait is normal and there is no static or motor ataxia. The pulse varies from 80-84, sitting and standing slightly accelerated under exercise (92) is full, regular and strong. The respiration is 18 and frequently sighing; temperature 98.0 degrees F. The heart and aortic areas are increased, especially the left ventricle as shown in the drawing (5.4; 4.0; 9.2 1-4 equal 10.6). The apex is in the nipple and negative in the fifth interspace. The chest box is large, expansion good and negative as to abnormal sounds of any kind. The spine, liver, kidneys, spleen and abdominal viscera are negative. No disease of rectum or anus. Vision and hearing by rough tests, normal. He had a chronic hypertrophic tonsillitis; no erypts or cheesy matter or pustules present. The sensory nervous system is negative. The head and neck seem weak and the head falls forward, drops, but this is not a motor loss, but due to his somnolent tendency. The thyroid is slightly enlarged in both lobes, soft, no throbbing, no purr; no glands are enlarged in the lymphatic system. Genitalia both external and internal are well developed and are above the average man's. The testicles are large and firm, there is no varicocele. The father states he has been with him almost continuously, but has not noticed any sexual erythrim nor any tendency to auto-erotic practices. In fact, he is seemingly frigid and impotent; no matutinal erections have been observed. The scar of the bed sore is deep and firm and partially adherent to the sacrum; the burn on the calf shows the scar ordinarily present after that of the third degree. Mentally, he worries a great deal; is irritable; shows marked inattention and unless you maintain a high degree threshold of consciousness, he lapses into sleep. Slept almost continuously in reception room and some during the examination, but if he can be awakened and entertained, presents a pleasing front. When thoroughly awakened is moderately active, remembers the tests well, acquiring quickly, but in ten minutes cannot repeat answer correctly, showing a marked grade of memory loss. Insight fair, intellectual level low, with content of thought normal. All during the psychic and physical examination he was

sighing for which he could suggest no reason. The moment his attention is lessened his face assumes a sleepy expression, he slouches in the chair and his eyelids tend to droop. Stripped, he presents a markedly feminine appearance, and type; the general stoop of neck and shoulders is typically feminine as is the general adiposity. The arm is long, round, tapering, the hand is rather heavy, medium long fingers, good size, but tapering. He has a typical virginal breast, firm, with well developed nipple and well marked areola; upon pressure no lacteal fluid was present. This is well shown in all three of the cuts. The abdomen and moderate spinal lordosis gave a certain tilt to the pelvis indisputably feminine. There is a roll of fat above the pubic, heavily covered with hair very suggestive of a womanly configuration, the hair area being at its upper edge nearly horizontal. This and the marked masculine genitalia are well shown. The reach of the arms is 64 1-2 inches; head brachycephalic; circumference 21 3-4 inches; eyes rather wide apart; forehead large and square.

The laboratory findings were as follows:

The Blood: Fresh specimen showed rouleaus present; normal shape; no abnormal elements. Hemoglobin 95 (Fleischal); color index 84. Reds, 5,620,000; whites, 22,812; rates 1; 250. (Normal 700). Differential count: Lymphocytes 18; large mono-nuclears 2; polymorphonuclear neutrophils 80; polymorphonuclear eosinophiles 0.

Malarial plasmodium present.

Blood Pressure: Systolic 120; diastolic 80; pulse pressure 40.

Acidosis: Alveolar tension 40, (normal 40); acidosis index 1.00 (normal 1.00).

Blood Serum: Wassermann negative; prompt hemolysis: 15 minutes; controls perfect.

Uric acid 2.00 mg. (normal 1. to 2.5 mg)
Creatinin 1.40 mg. (normal—1. to 2.5 mg.)
Creatin 6.00 mg. (normal 5. to 10 mg.)
Sugar 0.18% (normal.....0.9 to 0.12)

Radiologic Examination: Heart and Lungs; general fibrosis with some glandular enlargement in both lungs. Sella Tursica; Normal; if anything slightly smaller than normal. Partial Union Epiphyses of ulnar and radius at age 15; normal age 18 to 20.

Urine: Twenty-four hour specimen:

Amount 1026 c.c.

Specific Gravity, 1.010.

Total solids, 23.30 (normal 34.19).

Acidity, 15 units (normal 30).

Urea, 10.4 grams (normal 13.29).

Albumen, none.

Sugar, none.

All other ingredients and microscopical examination negative.

Sugar Toleration Test: 49 grammes.

Feces: Reaction acid; some mucous, fat, starch, no parasites.

Gastric Test Meal: Ewald; one hour.

Total acidity.....90 (normal 45-50)

Free Hcl.....44 (normal 10-15)

Combined Chlorin.....64 (normal 45-50)

Organic Acids.....00 (normal 00-)

Marked Hyperacidity.

We may pause for a few minutes and consider an interesting sequence of events, to-wit:

1. A normal youth growing and developing along healthy average lines.

2. A series of profound toxemias; influenza, suppurative appendicitis, gastro-intestinal toxemia (?); suppurating bed-sores and burns.

3. An exhaustive phase following the first two infections; a gastro-intestinal toxemia with sudden, severe, deep-seated pituitary (?) headache, followed by profound and added toxemias, a condition known to be capable of causing endocrinological exhaustion.

4. Even during this stage of profound almost fatal toxemia with emaciation, a skeletal growth of 2.5 inches (10 c.m.) takes place.

5. An intermediate or declining phase.

6. The status praesens.

Let us consider for a brief space the question of profound toxemia. It is now generally admitted I believe that under such stress the system rallies all its resources, as a Nation does in time of war, to combat the invading host, micro-organistic in character and saves life and limb by the establishment of immunity. In this work heavy drafts are made on the endocrinal glands, especially the adrenals, thyroid and pituitary. As I view this case, the hypothesis that best fits would be a primary adrenal exhaustion, a secondary thyroidal weakness and finally an effort on the part of the hypophysis to take care of the organism. In this latter phase we have that disturbance of hypersecretion that produced the various physical conformations and symptoms existant during the acuter phases and discovered later by examination. I enumerate them as follows:

1. Skeletal growth, spacing of eyes and shape of skull.

2. Large and square teeth; early union of epiphyses.

3. Profuse cranial hair, heavy and horizontal eyebrows. Feminine pubertal hair.

4. Sexual development, early and excessive.

5. Pulse increased; temperature.

6. Mentally excitable, irritable, petulant, "difficult."

These symptoms and developmental results represent in my opinion the rise, the peak and decline of a state marked by a lack of control of the pituitary or its stabilization by the thyroid. As fatigue and partial exhaustion commence the case enters the hypo-hypophyseal stage. The organic and structural changes produced in the physical organism by the previous state of excess of pituitary hormone in the circulation having become fixed, *remain*, but the symptomatic and functional changes give way to the absence, diminution or disorder of the gland's secretion so we enter the terminal phase of hypo or dyspituitarism presented by the following symptomatology, originating so markedly and distinctively that the family physicians and nurses can almost name the day and hour.

We note the following:

1. Abnormal desire for food, with increase of fat almost to obesity.
2. Lassitude, drowsiness, somnolence, with slow movements.
3. Mental apathy, dullness, loss of attention, memory and self-control.
4. Metabolism slowed; reduced urinary solids; subnormal temperature; polyuria nocturna et diurna.
5. Sexual inactivity; frigidity, impotence and a suggestion of an adipose-genitalis type.
6. Breast development (accompanying Gonadal inactivity).

As time rolls by there is some improvement (supposedly) and certain symptoms of the former state remain to which we may with due propriety call attention. These are:

1. Sweating, easily made profuse on exertion.
2. Low tolerance of sugar (48 grammes).
3. Pulse variable (normal or increased).
4. Metabolism normal; temperature normal.

Of the mixed type of symptoms we may mention his mental condition, characterized by an emotional, irritable, unethical and "difficult" state alternating with the apathetic, drowsy, sullen and somnolent periods from which to arouse him requires a rather active stimulation of the threshold of consciousness.

COMMENT

In my opinion we have here, as is so often the case, for the endocrinal glands are intimately related, a pluriglandular condition, general at the start, terminating in a preponderance of action of the pituitary body, first in over-activity, secondly in under-activity, with somatic and functional states characteristic of each, constituting a dyspituitarism viewed as a whole.

I cannot in the brief time at my disposal touch upon the anatomical physiological and radiographic and other metabolic or other functions of this gland, which the ancient priests called the "envelope of the soul", the French stigmatized as "S'organe enigmatique" and Dickens immortalized in clinical characterization as the fat boy "Joe". Suffice it to say, however, that in this report I have really dealt only with the grosser and more physical effects due to hypophyseal disturbance and have not tried to discuss the hypothesis that perhaps many of the emotional states and perhaps soul activity may originate from stimulation of or be due to, pituitary secretion.

DISCUSSION:

R. Alexander Bate: Dr. Pope's report is so perfect and accurate in detail that there is little left to be said; every change in the symptomatology of the case can be traced to its origin. For example, the fever is explained by the overproduction of various glandular secretions to overcome the original toxemia; there was probably excessive activity of the thyroid, the adrenals and the pituitary. As the pituitary gland which governs cellular development became exhausted sugar tolerance was increased. When the auto-protective secretions (thyroid, suprarenal and posterior pituitary) were exhausted in overcoming the infection, the patient grew two and a half inches in height, his genital development increased, etc. These effects show perfectly the hyper-activity of the anterior pituitary. When the infection was overcome and secretions of the thyroid, posterior pituitary and adrenals returned to normal, the anterior pituitary secretion was neutralized.

There was at first probably an hyper-activity of the anterior pituitary which later became hypo. I believe unquestionably the patient had beginning gigantism, as shown by his skeletal and genital growth, which is now under control. The reduction in fat indicates that the condition has now become an hypo- instead of an hyper-endocrine state.

W. E. Gardner: I would like to inquire whether or not a carbohydrate test has been made in this case since occurrence of the recent changes. As I understood the report, in the early history of the case there was a low sugar tolerance which would indicate an hyper-pituitary secretion. If there is now an hypo-pituitary secretion there should be a high sugar tolerance; and I would not suspect the case had entered the hypo-pituitary stage unless a high sugar tolerance had been demonstrated. We know cases of this kind do pass from an hyper to an hypo-secretion just as do thyroid cases, and that is the reason the carbohydrate test is frequently used as a therapeutic guide. In appearance the pictures submitted indicate at least a dyspituitary

condition; the thyroid is probably hyper-secretive in an effort to compensate for the faulty secretion of the pituitary body.

Curran Pope, (closing): The highest toleration for sugar was 250 grams, the lowest 48 grams. The diagram which I present shows the curves perfectly.

The time of my report being limited I could not mention half the therapeutic indications, but the administration of whole pituitary and thyroid gland substances has improved the patient wonderfully physically. However, in the two and a half months he has been under observation there has been practically no change in his mental state. If anything his moral and ethical nature is worse to-day than when I first saw him. Some of the fat has disappeared, he is getting more muscular, he is more capable of helping himself physically and neurally, but mentally there has been little or no change.

Tests of the urinary solids and all other known tests were made with the exception of the use of the Benedict instrument; it would be interesting to make the latter had I the requisite facilities.

NEWS ITEMS AND COMMENTS

The New York Committee on After-Care of Infantile Paralysis Cases published and distributed the report of "The Survey of Cripples in New York City."

Our aim has been to send this report to those in a position of responsibility in agencies for cripple and to all those who might have a general interest in cripples, and in plans for their aid. The undersigned would be glad to know of anyone who has been overlooked and would appreciate suggestions for further possible distribution of the report.

ROBERT STUART, Director,

N. Y. Committee on After-Care of Infantile Paralysis Cases, 69 Schermerhorn Street, Brooklyn, N. Y.

The Medical School of Washington University, St. Louis, Missouri, is soon to publish and distribute an announcement of short courses for practitioners of medicine, varying in duration offered in medicine, surgery, gynecology, obstetrics, neurology, urology, orthopedic surgery, pediatrics, surgical pathology, roentgenology, ophthalmology, otology, rhinology and laryngology. The primary object of these courses, which will begin about April 4, 1921, is to furnish practitioners in Missouri and neighboring states with the opportunity of renewing contact with a large amount of well correlated clinical material.

BOOK REVIEWS

Refraction and Motility of the Eye, with Chapters on Color Blindness and the Field of Vision Designed for Students and Practitioners.

—By Ellice M. Alger, M. D., F. A. C. S., Professor of Ophthalmology at the New York Post-Graduate Medical School, etc. With 125 illustrations. Second edition revised, F. A. Davis Company, Publishers, Philadelphia. English Depot, Stanley Phillips, London. Price \$2.50 net.

The author has written this volume to meet the needs of the general practitioner as well as the ophthalmologist and beginners in the latter profession will find much of value, as the book is profusely illustrated and written in a clear accurate style.

An Introduction to Bacteriology for Nurses.—

By Harry W. Carey, A. B., M. D., Assistant Bacteriologist Bender Hygienic Laboratory, Albany, N. Y., Pathologist to Samaritan, Troy and Cohoes Hospitals and City Bacteriologist, Troy, N. Y. Second Edition Revised. F. A. Davis Company Publishers, Philadelphia. English Depot, Stanley Phillips, London.

Many of the duties of the nurse require a knowledge of the principles of bacteriology in order to be performed intelligently. It is difficult, however, for anyone instructing nurses, to decide just how much of the subject to attempt to teach.

The basis of this book is the lecture notes that the author used during the last eight years in teaching the nurses of the Samaritan Hospital Training School. In incorporating them into book form the subject has been presented in clear and in simple language the subjects essential for the nurse to know. A few blank pages have been inserted at the end of each chapter for the convenience of the student in adding useful notes from time to time.

The Mastic Test.—Schonfeld describes his modification of the Emanuel-Cutting mastic test to apply to the cerebrospinal fluid. The findings coincide with those of the Wassermann reaction only when there are pronounced specific changes in the spinal fluid, such as are found in syphilis of the brain and in general paresis. He says that the mastic reaction, therefore, cannot be considered as a substitute for the Wassermann reaction. It is interesting from a theoretical standpoint, but clinically its diagnostic value is no greater than that of the Pandy, Weichbrodt and other reactions.

Kentucky Medical Journal

PUBLISHED BI-MONTHLY BY
THE KENTUCKY MEDICAL ASSOCIATION
Incorporated

Editorial and Business Office, Cor. State and Twelfth Sts.

Entered as second class matter October 22, 1906, at the Postoffice at Bowling Green, Ky., under act of Congress, March 3, 1879.

Subscription Price\$2.00

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Next Meeting Louisville, September, 1921.

COUNTY SOCIETY REPORTS

Carlisle—The Carlisle County Medical Society held its regular annual session at Bardwell Dec. 7th, 1920, in T. J. Marshall's office, at 11 a. m. The president being absent, W. L. Mosby, was elected President pro tem.

After Divine invocation by R. T. Hocker, the minutes of the previous meeting were read and approved.

G. W. Payne read an interesting paper on Cancer of the Cervix. Dr. Marshall opened the discussion, followed by all members present, Dr. Payne closing, emphasizing an early examination of all women between the ages of 35 and 60 years who are having profuse hemorrhages.

Society adjourned for dinner at Hotel Richardson.

Afternoon session at 1:30 p. m.

W. L. Mosby read a very interesting paper on Economic Problems of Medicine: Especially Applied to Country Practice: The paper was well received and discussed by all present, and the essayist closed the discussion.

Motion carried that a committee of three be appointed to investigate the cost, and best way of establishing, a small laboratory and hospital where team work can be utilized. The President appointed W. L. Mosby, Marshall and Dunn.

H. A. Gilliam being absent his paper was passed.

The following officers were elected for the ensuing year: R. C. Barrow, President; J. F. Dunn, Vice President; G. W. Payne, Secretary and Treasurer.

After which the president read his annual address which was entitled "The Schick Test for Diphtheria," which was well received.

The society selected Arlington, for our next regular quarterly meeting, which meets the first Tuesday in March, 1921, at 4 p. m.

GEO. W. PAYNE, Secretary.

Carter—The Carter County Medical Society met December 16th, and elected the following officers: W. A. Horton, President; L. G. Nickell, Secretary.

L. G. NICKELL, Secretary.

Christian—The Christian County Medical Society was called to order, in regular session at 1:30 p. m., by President J. H. Rice.

Members and visitors present: O. L. Barnes, Hopkinsville; J. L. Barker, Pembroke; Austin Bell, Hopkinsville; J. J. Ezell, Lafayette; D. H. Erkiletian, Hopkinsville; J. G. Gaither, Hopkinsville; C. W. Gower, Trenton; P. E. Haynes, Hopkinsville; J. W. Harned, Hopkinsville; J. B. Jackson, Hopkinsville; T. W. Perkins, Hopkinsville; W. E. Reynolds, Hopkinsville; J. H. Rice, Hopkinsville; Andrew Sargent, Hopkinsville; F.

M. Stites, Hopkinsville; J. E. Stone, Hopkinsville; W. S. Sandbach, Pembroke; H. W. Watts, Pembroke, and R. L. Woodard, Hopkinsville.

After the minutes of preceding meeting were read and approved the scientific program was postponed and election of officers for 1921 entered upon. The following were elected: President, F. P. Thomas, Hopkinsville; Vice President, W. S. Sandbach, Pembroke; Secretary and Treasurer, E. McD. Trabue, Pembroke; Delegates to State Society, Austin Bell, Hopkinsville, and E. McDowell Trabue, Pembroke; Alternates, J. G. Gaither, Hopkinsville, and O. L. Barnes, Hopkinsville.

A motion was adopted by the society to the effect that Drs. J. W. Harned, Hopkinsville, J. E. Stone, Hopkinsville, and R. L. Woodard, Hopkinsville, be recommended for appointment as members of the County Board of Health.

Adjourned.

W. S. SANDBACH, Secretary,

E. McDOWELL TRABUE, Secy.-Elect.

Daviess—The regular annual meeting of the Daviess County Medical Society was held at the City Hall, Owensboro, on Dec. 21, 1920. The president, I. J. Hoover, presided.

Twenty-eight physicians were present. The Treasurer reports fifty dollars in treasury.

Guy Aud, Louisville, read quite an interesting paper on "The End Results in Operations Upon the Bile Passages." The paper was discussed by several members.

S. P. Oldham had a good paper entitled, "Does Dieting the Mother Influence the Growth and Development of the Foetus in Utero?"

A very interesting discussion followed.

The election of officers resulted as follows: President, C. M. Rice, Sutherland; Vice President, W. H. Strother, Owensboro; Secretary-Treasurer, J. J. Rodman; Delegate, W. H. Strother.

The society took dinner in a body at the Rudd House.

J. J. RODMAN, Secretary.

Henderson—The Henderson County Medical Society at its annual business session elected the following officers for 1921:

J. U. Ridley, President; C. R. Tanner, Vice President; Peyton Ligon, Secretary-Treasurer; W. W. Wilson, and M. Y. Marshall, Delegates; R. E. Smith and G. W. White, Alternates; Geo. M. Royster, Censor.

PEYTON LIGON, Secretary.

Harrison—The Harrison County Medical Society held its annual meeting December 6, for election of officers for 1921, at Elks Club rooms. Meeting called to order by the President. Reading of minutes of previous meeting omitted. The

following members and visitors present: H. C. Blount, G. A. Becket, W. N. Carr, J. P. Chamberlain, L. S. Givens, Josephus Martin, M. McDowell, E. S. McIlvain, J. F. Morgan, N. W. Moore, W. B. Moore, J. M. Rees, N. T. Smizer, C. L. Swinford, L. N. Todd, J. E. Wells, J. P. Wyles. Visitors, J. A. Stucky, J. D. Best, Geo. F. Wilson, Scott, Breckenridge, Ernest Bradley, L. C. Redmon, Woolfolk Barrow, C. Dewese, C. G. Ireland, J. D. Maguire, Julian Estill, Daniel J. Healy, Chas. Vance, J. C. Louis, W. T. Briggs, Chas. C. Garr, W. H. McLearn, W. R. Purnell, W. B. McClure, J. T. McClymonds, Sam B. Marks, Carl Lewis Wheeler, Maj. Lon. B. Morrison, Capt. Walker and E. S. Maxwell, of Lexington. C. L. Bonfield, of Cincinnati, H. C. Clark, N. B. Chipman and Chas H. Kendall, of Falmouth; Chas. G. Daugherty, J. A. Orr and W. C. Usery, of Paris; J. W. Baird and W. D. Sanford, of Sadieville.

Officers elected: President, Josephus Martin; Vice President, C. L. Swinford; Secretary, W. B. Moore; Treasurer, B. B. Petty; Censor, E. S. McIlvain; Delegate, W. B. Moore.

After the election of officers, short talks were made by J. A. Stucky, C. L. Bonfield, W. B. McClure, H. C. Clark, C. G. Daugherty, J. E. Wells, A. G. Ireland and others.

The meeting adjourned to the billiard room where lunch and cigars were served. Dr. Givens, in his charming way, presided as toastmaster, and of course secured a number of responses which every one enjoyed to the fullest.

W. B. MOORE, Secretary.

Fleming—At the regular meeting of the Fleming County Medical Society the following officers were elected: E. T. Runyan, President; W. T. Jessee, Vice President; C. W. Aitkin, Secretary-Treasurer, J. B. O'Bannon, Delegate; S. F. O'Brien and T. B. Riberlin, Alternates; A. S. Robertson, W. S. Reeves, E. T. Runyan, Censors. C. W. AITKIN, Secretary.

Marshall—At the annual meeting of the Marshall County Medical Society the following officers were elected: S. L. Henson, President; L. E. Stinson, Vice President; E. D. Covington, Secretary and Treasurer; L. L. Washburn, Delegate, L. L. Washburn, Covington and Eddleman, Censors.

E. D. COVINGTON, Secretary.

McCreary—At the regular meeting of the McCreary County Medical Society, the following officers were elected: A. A. Weddle, President; W. R. Cundiff, Vice President; R. M. Smith, Secretary-Treasurer; C. E. Cain, R. P. Severs, S. S. Foster, Censors.

R. M. SMITH, Secretary.

KENTUCKY MEDICAL JOURNAL

BEING THE JOURNAL OF THE KENTUCKY STATE MEDICAL ASSOCIATION

Published Under the Auspices of the Council

VOL. XIX. 

BOWLING GREEN, KY., FEBRUARY, 1921

No. 2

EDITORIAL

KENTUCKY PEDIATRIC SOCIETY.

Every great war has resulted in advances in the mental, moral and social progress of the people. But each war was different in the character of that advance. The Civil War was sociologic, the Cuban and the Russian-Japanese war stressed the important bearing of disease upon the efficiency of the soldier. The World War utilized this medical and sanitary knowledge, but again the advance in human betterment focused upon the unfit, and has made it necessary that the people of the world should be made more perfect in health and physique. The lesson for us is that the child must be conserved.

We need intensive work along the lines of prenatal care of the mother, that the mother may have such medical care as shall lessen her sickness and she may thus be conserved, but no less attention should be concentrated upon the unborn infant, who has a right to be born with as pure blood and as good an heredity and environment as is possible.

The feeding of the infant, which is apt to be difficult, must be made more familiar to the general practitioner, so that babies may not become the sport of every patent food preparation.

The pre-school age has its problems of nutrition and the prevention and treatment of enlarged tonsils and adenoids, and the proper care of primary teeth, comfortable clothing and insistence upon necessary sleep. The school age runs the gamut of contagious diseases. There is no more valuable field of work than this, for the Pediatrician and the Sanitary Officers, who can so well get together in the handling of the health problem of the public school system. We know and must be made to realize that this age should be protected from contagious disease.

The sub-normal cases, defectives, and mentally diseased, furnish one of the biggest problems of the State and here in Kentucky,

we are woefully behind in the proper state, care of this dependent class.

Finally, the wonderful changes in the boy and girl, which brings them to manhood and womanhood, offer a great food for study and observation. Too often such fundamental changes take place and are entirely ignored by the family physician and the real life of many boys and girls made miserable, many times because they are not understood by the parent or the doctor.

The study of the diseases of infants and children is more difficult than those of the adult, in that the physician must work from the constructive standpoint. He is there to help nature in a normal growth. He must guard against common errors of feeding, environment, training and he must prevent diseases from arising in the child and he purposes to secure a sound mind in a sound body. A large part of the medical care of the adult, is to abate results of degenerative changes, acquired bad habits, toxicities in blood and tissues, inheritances and vicious traits. The battle serves only to push Death back some months or years. A physician who is interested in children can help them resist disease, and go about their work in the world without let or limitation until their three score years and ten shall be accomplished.

It has been the general feeling that the child of our Country must have attention, better attention, so that a better and stronger race should grow upon our soil. Pediatricians have felt this call upon them, to do better things for the child and there have been organized throughout the Country, State Pediatric Societies, to direct and plan for the children of our country. There has been organized recently, at the State Medical Society a Kentucky Pediatric Society, which is not confined to those who devote their entire time to the child, but welcome every man in general practice, who is especially interested in the children. In every town, there is some one man, who is more interested in the child than in other phase of medical work. It is

hoped that these may get together and learn to know each other, and thus knowing each other, they may unite in a common program, which shall be for the good of the children.

The Society was organized with Dr. Philip F. Barbour, Louisville, as President, Josephine E. Hunt, Lexington, Vice President, and James W. Bruce, Louisville, as Secretary. We want any man who is interested in this work to send his name, so that we may plan definite things for the future.

A NEW ACTIVITY.

The medical profession of the State will welcome the provision of the new law in regard to the State Board of Charities and Corrections which will provide for the inspection and licensure for private institutions for the care of mental cases. Kentucky was one of the few states in which this has never been done, and the excellent physicians who are doing this work are entitled to the indorsement of the State Board of Charities and Corrections, and to protection from the scoundwags who have heretofore started twenty-four hour cures for the whiskey habit and similar fake concerns.

Kentucky is proud of such institutions as Drs. Gardner's, Sprague's, Pope's and Beechurst, and our people are entitled to know officially that they are as good as the best.

We congratulate the State Board of Charities and Corrections on securing Miss Reeves who comes fully equipped for this important work and we assure her the support of the medical profession of the State.

COLLECTED PAPERS OF THE MAYO CLINIC.

One of the pleasantest visitors that comes to the JOURNAL each year is the "Collected Papers of the Mayo Clinic." The volume for 1919 has just arrived and no physician who desires to keep abreast of the best developments in modern surgery can afford to be without it.

Of especial interest is an article of Balfour's on "Life Expectancy of Patients following Operations for Gastric and Duodenal Ulcer." Diagnosis of this type of stomach disease is now so frequent, and the family physician must be in a position to tell his patient just what to expect, not only from the operation itself, but from the neglect of it, that such an article from such an authority is of especial value.

Judd's articles in this issue are all on Gen-

ito-Urinary Surgery, and are the classics one would expect from him.

No other surgeons have broader interests than the Doctors Mayo themselves. This could not be better illustrated than by a timely statement on "The Relation of Mouth Conditions to General Health" and "Surgical Treatment of Bunions" by Dr. C. H. Mayo, and "The Relation of Cancer to the Prolongation of Human Life" and "Socialization of Medicine and of Law", by Dr. W. J. Mayo.

Kentucky physicians will be especially interested in Rosenow and Sturdivant's study of Influenza and Pneumonia. Kentuckians will take a special pride in the contribution of Dr. W. C. MacCarty. The whole volume has the usual typographic excellence of the Saunders publications, and we commend it to our readers most cordially.

IMPORTANT DECISION REGARDING THE WRITING AND FILLING OF NARCOTIC PRESCRIPTIONS.

AIDING AND ABETTING VIOLATIONS OF HARRISON ACT BY ISSUING PRESCRIPTIONS.

This article from the January issue of the *Illinois Medical Journal*, will be of interest to physicians in Kentucky.

A physician duly registered as such with the collector of internal revenue and who has paid the tax was charged with violation of the Harrison Narcotic Law by unlawfully and willfully aiding and abetting certain named druggists in making illegal sales of morphine and cocaine, by giving the person to whom the sales were alleged to have been made prescriptions, which were by them presented to the druggist and filled by the druggist. The persons to whom the prescriptions were issued were at liberty to have them filled by any druggist selected by them. There was no preconcert between the physician and the druggists charged. It was charged that the defendant contemplated that his prescriptions would be filled by druggists who knew that they were issued to gratify the appetite of addicts for the drugs, and not the alleviation of suffering or the cure of disease. The illegality in the sale was charged to have consisted in the act that the sale was made neither to one who had or was entitled to have an order blank, nor was it made on the prescription of a physician within the meaning of exception (b) of Section 2 of the Harrison Act. That exception is as follows: "To the sale, dispensing or distribution of the aforesaid drugs by a dealer to a consumer under

and in pursuance of a written prescription issued by a physician * * * registered under this act."

The Circuit Court of Appeals, Fifth Circuit, holds that notwithstanding this exception, a sale by a druggist who knows that the prescription was issued to gratify the holder's appetite, and not to cure disease or alleviate suffering, violates the law and the physician issuing the prescription, knowing it is to be filled by a druggist having such knowledge, aids and abets the violation. Knowledge by a druggist that a prescription under the act issued to gratify the holder's appetite, and not to cure disease or alleviate suffering, is essential to guilt, and negligent failure to inquire will not take the place of knowledge. But it was held that an instruction erroneously authorizing a conviction, though the druggist had no actual knowledge that a prescription was wrongfully issued, was not ground for reversal where reasonable men could have drawn but the one inference that the druggist had such actual knowledge.—*Doremus v. United States*, 262 Fed., 849.

SCIENTIFIC EDITORIALS

VINCENT'S ANGINA; A TREATMENT BASED ON A NEW HYPOTHESIS; PRELIMINARY REPORT.

The following treatment based upon an hypothesis which we wish to present is suggested because of the resistance of a few cases of Vincent's disease to all the known methods of treatment.

The etiology of Vincent's disease or Vincent's Angina, seems to be definite. Plaut and Vincent demonstrated the fusiform bacillus in conjunction with spirochetes in pseudo membranous inflammation of the throat.

Fusiform bacilli and spirochetes have been encountered in cases of ulcerative stomatitis, dental caries, noma and gangrene and around teeth which show deposits of tartar, etc.

However the clinical appearance of Vincent's Angina with the freedom of other organisms in number from the smear and the relative number of spirochetes and fusiform bacillus makes its picture rather clear. Doubt as to the etiological relationship of the two organisms to the disease has been eliminated by the recent work of Tunnicliff.

* In a section of ulcero membranous tonsil she was able to demonstrate an outer necrotic layer practically free from bacteria, a middle zone made of masses of fusiform bacilli and spirochetes and an inner zone of living tis-

sue in which the spirochetes were found in advance of the fusiform bacilli.

Tunnicliff has maintained that the fusiform bacillus and spirochetes are different phases in the life of one organism, while others as confidently consider them two separate and distinct organisms. "The fusiform bacillus and the spirochetes accompanying it in the lesion were never encountered together in cultures made from single colonies, although Tunnicliff claimed that the fusiform bacillus and the spirochete were only different forms of the same organism."

It is our opinion that we are dealing with two separate and distinct organisms and that the virulence of the infection is due to a symbiotic action of the two. Believing that the symbiotic action obtains a method of treatment has suggested itself to us and the experimental and bacteriological work is now in progress at the State Board of Health laboratory.

Believing that the disease is due to the joint action of the two organisms, an attempt is being made to increase the immunity against the fusiform bacillus, thereby preventing a symbiotic activity. To accomplish this anaerobic cultures are being made and vaccines prepared. By producing an immunity with a vaccine and inhibiting the growth of the fusiform bacillus, symbiosis will be prevented and according to our own view the lesion will disappear.

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G. H. HEYMAN.

A PLEA FOR A MORE CAREFUL EXAMINATION OF THE TONSILS.

The tonsils are not the exclusive property of Eye, Nose, Ear and Throat specialists. The general practitioner in the long run sees more tonsils than the specialist because there are more of him. There is no reason why the general practitioner cannot make as careful an examination of the tonsils as the specialist. It

is a perfectly easy thing to do but the fact is that the examination is usually superficial and of little value except where the tonsils protrude and are easily seen. We are coming to know that the protruding tonsil is often the least dangerous and that a tonsil entirely hidden by the anterior pillar may be badly diseased. Sometimes the patient will say that the doctor has told him that he has no tonsils when on examination they will be found to be small and hard to see but when seen they will be found to be badly diseased.

To properly examine the tonsils one must have a good light, a head mirror, a good tongue depressor and a blunt instrument to press on the anterior pillar. Probably the most satisfactory instrument for this purpose is a small post-nasal mirror. It has a long handle, is strong enough, is flat on the end and the angle is right if it is necessary to pull the pillar back. If the tonsil does not protrude the mirror is placed against the anterior pillar and gently pressed till the tonsil is pushed well out into the throat. Sometimes it is necessary to pull the anterior pillar back and press on the tonsil itself.

With this simple technique the tonsil is brought into view if there is any pus in the crypts it can be pressed out and actually seen. This method ought to be used not only for chronic cases but also for acute cases. I have seen several cases of diphtheria where the process was well advanced but entirely hidden by the anterior pillar. Only on retracting the pillar was the diphtheritic membrane seen. This is a message to the general practitioner. Learn to use a head mirror, a good tongue depressor and some sort of a pillar retractor and you will be surprised at the things you see behind the anterior pillar.

R. H. COWLEY.

Hospital Ships.—Chevalier is inspector general of the medical department of the navy, and he here describes the work of the various hospital ships bringing the wounded and sick from Flanders and Serbia and from the Mediterranean fronts. He urges that in building vessels for the merchant marine some should be designed so they could be rapidly transformed into hospital ships at need, the hospital equipment kept in readiness at some convenient point.

Calculi in the Pancreas and Diabetes.—In the case described by Apolloni the young woman had been presenting symptoms of diabetes for a year and the pancreas was found 12 cm. long, with nothing left but a shell crowded with sand and calculi. The extreme hemosiderosis in the liver was a further necropsy surprise.

ORIGINAL ARTICLES

A YEAR'S DEVELOPMENT IN PEDIATRICS.*

By HENRY ENOS TULEY, Louisville.

Unless specially interested in pediatrics, one is apt to miss much of value relating to this subject in the special and other journals, and for this reason I have thought it would be profitable to call attention to a few of the subjects discussed in the medical journals of the year, as well as to one or two other rather neglected subjects in pediatrics.

The question of child conservation following the world war is one which is claiming the thought and attention of the peoples of every country. The medical profession as a whole, not alone the pediatricists, should take the lead in this movement, that misguided enthusiasm of lay workers be not allowed to lead to impractical and foolish expenditure of money and hysterical advocacy of state and national paternalism.

We look with satisfaction at the report of the latest Rockefeller benefaction of many millions of money to foster child welfare and improve the condition of the mothers who are poor. Who does not approve the prevention by law of the working of children or of pregnant women in factories, but the enactment and enforcement of these laws must be carefully and sanely done. School inspection is of great benefit, but who of us does not know of much harm and antagonism resulting from poorly trained or tactless school inspectors or nurses coming in contact with pupil and parents.

Realizing the importance of follow-up work in the homes of the sick for whom the City Hospital was provided, I was able early to install a social service department at the hospital. Though limited in its personnel, it has done much valuable work, and through the close co-operation of the Public Health Nursing Association, follow-up work in the homes has prevented increased hospital days by return of patients to the hospital because of indiscretions and overwork on their return to the home. We are deeply grateful to Miss Sophie Nelson, Superintendent of the Public Health Nursing Association, for her sympathetic co-operation at all times.

Among the other activities looking to child conservation at the City Hospital are the

*Read before the Louisville Medico-Chirurgical Society.

prenatal clinic, the nutritional clinic and the dental clinic.

The prenatal clinic, under the efficient supervision of Dr. Alice N. Pickett, enrolls all pregnant women who expect to be confined in the hospital, or who are referred by the Associated Charities and Public Health Nurse for home delivery. In this way patients are watched during their pregnancy and all venereally-infected women are early placed in the way of obtaining an intensive course of treatment in the venereal clinic, lessening the chance of premature births and inherited syphilis, which will shortly claim our attention. In this clinic 871 cases were enrolled in the year ending November 1, with 430 new cases. Patients registered for home delivery are attended by the hospital interne, accompanied by one or two senior students and the Public Health obstetrical nurse. The student and nurse pay the post-partum visits.

The babies born of mothers registered in this clinic are requested to return to the nutritional clinic once each month for weighing and inspection. To this clinic below par pre-school age and school children are referred for weighing, inspection and instruction in food values. Miss Margaret Jefferson and Dr. T. K. Van Zandt are in charge of this clinic and the interest of the children and mothers kept up by their enthusiasm.

The dental clinic, in charge of an all-time dentist, Dr. Hower, paid by the university and maintained by the hospital, is doing a splendid work for hospital patients and school children. Since June 14, 1920, 869 patients were treated, 260 being hospital cases; 1,049 permanent teeth filled, 576 oral prophylaxis given, with 181 extractions. The clinic's value to hospital patient and to the health of the children cannot possibly be overestimated.

Too much cannot be said for the great increase of interest in pediatrics throughout the South. The growth of the pediatric section of the Southern Medical Association has been splendid and has done much to popularize the slogan of the section, "Better pediatrics in the South."

Spasmophilia.

Much has been written of the unstable equilibrium of the nervous system of the infant, convulsive manifestations during the first and second years of life being common. Irritations of remote origin acting upon the central nervous system in the infant are manifested by convulsions, in an adult the same irritation perhaps causing a severe up-

set of the heat-regulating center manifested by a chill. These convulsions are different from those to which we would specially call attention, viz: those occurring in the spasmophilic diathesis. Thiemich has described the spasmophilic diathesis of infants as a constitutional anomaly consisting in a hyper-irritability of the nervous system which is demonstrable by measurable electric stimuli, and which creates a pathologic tendency to partial and general convulsions of both tonic and clonic type.

The convulsions are influenced (1) by feeding; (2) season; (3) febrile infections; (4) age.

Spasmophilia is practically never seen in a breast-fed infant. Overfeeding, improper feeding and acute alimentary disturbances from these and other causes are the exciting factors.

This form of convulsions peculiarly occur practically always in the winter and spring months, between Christmas and Easter, ceasing in the summer months.

Any acute infection as pneumonia, influenza, the exanthemata, act as exciting causes.

The greatest incidence as to age is between the third month and the end of the second year. Convulsions occurring in an infant under three months of age can usually be found due to some other condition. If during the third year it is probably pettimal or tetany, not spasmophilia.

It is doubtful if any hereditary or familial predisposition can be proven in these cases.

The symptoms of this condition are eclampsia. By this is meant a series of convulsions, accompanied by loss of consciousness. There are tonic contractions of the muscles of the face extending to the muscles of the extremities, followed by clonic contractions for a brief period. Unlike epilepsy there does not follow a period of profound sleep.

Laryngo-spasms or laryngismus stridulus occurring in a child of the proper age is due to this diathesis and not alone to rachitis as has previously been taught. Tetany or carpopedal spasm may be a manifestation in which there is a clonic contraction of the hands and feet. Tetany of the hands and feet is referred to as "manifest tetany," while the Trousseau, Chevostek and Erb phenomena are called "latent tetany."

The Trousseau phenomenon is produced in spasmophilic infants by constricting the nerve trunks of the arm in its upper portion for a few moments, producing a sharp flexion of the hand upon the wrist. The Chevostek phenomenon is produced by striking the

cheek in the canine fossa under the superior maxilla which results in a lightning-like contraction of the muscles of the corner of the mouth and nose, those muscles supplied by the facial nerves.

The Erb phenomenon is the most constant and is that produced by electrical stimulation, showing a hyper-excitability of the nervous system.

The normal infant when tested at the median nerve will show the following: K. C. 1.41 milliamperes; A. C. 2.24 milliamperes; O. O. 3.63 milliamperes; K. O. 8.22 milliamperes.

The infant with spasmophilia will show a K. C. 0.10 milliamperes; A. C. 1.15 milliamperes; A. O. 0.95 milliamperes; K. O. 2.23 milliamperes.

In normal infants the K. O. is greater than 5 M. A.; in the spasmophilic less than 5 M. A.

In the normal infant the A. O. contraction is greater than the A. C. In the hyper-excitible it is less.

These tests are made with the galvanic current, a large flat electrode being placed on the chest and a small Stintzig electrode over the median nerve in the forearm.

The prognosis as to life is good in this condition, but its subjects often develop into nervous children, are easily frightened, sleep poorly, and learn to talk late and are slow in school.

The pathology of spasmophilia is not understood, though the trend of opinion is that it is a disturbance of metabolism.

Mysenbury (American Journal Dis. Children, Vol. 20, No. 3), in a series of interesting observations, has proven that the spasmophilic reactions are not dependent on a deficiency of the water soluble vitamin, fat soluble vitamin, or yeast filtrate.

In subsequent experiments in children between 2 and 7, the same author (American Journal Dis. Children, Vol. 20, No. 6) found that it is difficult to interpret the electrical reactions in children of this age; that an anodal hyperexcitability is found frequently, but in the absence of clinical symptoms, does not constitute a diagnosis of spasmophilia.

In view of the fact that this symptom complex is not seen in the breast-fed it is obvious that a resort to breast milk in those in whom the diagnosis is definitely made will prove of great benefit. If breast feeding be not possible entirely, supplemental feeding of a properly modified, fresh, clean, uncooked cows' milk can be used. The feedings should not be too large or too frequent.

The administration of the calcium salts is

beneficial, as is phosphorus with cod liver oil.

Congenital Syphilis.

No class of infections, perhaps, is so neglected as congenital syphilis. No other infection is so far-reaching in its effects if the infant survives, or the cause of as many deaths under one year of age. The study and better knowledge of this subject is therefore most important as a child-conservation agency.

Malsberg (Journal A. M. A., October 11, 1919) (Jeans, Am. Jour. Dis. Children, Vol. 20, No. 1) states prevalence of syphilis in the general population can stand the test of examination. The reason is that no study has represented a fair average of society. Jeans (Amer. Jour. Syphilis, January, 1919) estimates an incidence in the poorer classes from 10 to 20 per cent of the adult males and 10 per cent of married women. McLester found (Am. J. M. S., March, 1918) 18 per cent of 567 private patients seen in consultation to be syphilitic. Jeans (loc. cit) estimates from 5 to 6 per cent of the infants of the poorer class have syphilis. He further states that 75 per cent of children of syphilitic parentage are infected, and 30 per cent of children born alive in syphilitic families die in infancy; and only 17 per cent of all the pregnancies in syphilitic families result in living non-syphilitic children who survive the first year. The British Commission on Venereal Diseases concluded that 50 per cent of fetal deaths was due to syphilis.

We maintain that in public clinics every pregnant woman should have at least one Wassermann test made as early after the pregnancy is diagnosed as possible, which would include, of course, all women who have had more than one miscarriage, in whom the suspicion of syphilis is very great. If a positive report is had the mother should be subjected to a rigid, intensive anti-syphilitic treatment until the child is delivered.

Adams (British Medical Journal, November 20, 1920) reports the result of three years' treatment at a venereal center for pregnant women. He states that he doubts if any disease, even tuberculosis, was so destructive to child life or so disastrous to child health as syphilis, and looked forward with confidence to seeing the wastage of infant life from syphilis almost come to a vanishing point in the future. The results of his experience showed that a pregnant woman with syphilis, whether active or latent, if treated for three or four months before her confinement, would probably be delivered of a healthy child at full term.

Jeans (Jeans Am. Journal Dis. Children,

Vol. 20, No. 1) states it is generally recognized that the blood Wassermann may be negative in a syphilitic child at birth, and that it becomes positive in the course of a few weeks or months should a blood Wassermann be done on the blood from the cord obtained before it is tied. If this is positive it should be confirmed by a second test ten days or two weeks after birth.

Fordyce-Rosen (Journ. Amer. Med. Assn., Vol. 75, No. 21) states blood taken from the umbilical cord at the time of birth may be strongly positive, ten days later blood from the longitudinal sinns, jugular vein or veins of the forearm, may give a negative result, and I suppose *vice versa*, though the authors do not so state. It is difficult to understand why there should be this difference ten days after birth.

Alfred E. Meyers,* Cleveland, calls attention to the value of luetin in out-patient work, in the diagnosis of congenital lues, especially of the latent type. In his investigations luetin was used in every child that gave the slightest suspicion of the disease, either from the history or physical examination; in fact, in every child who could not score 100 from a developmental standpoint, and all were checked by the Wassermann reaction.

Comment is made upon the various opinions of the Nogouchi test since he first reported it in 1912. Orleman-Robinson found the luetin test is more constant in tertiary and latent hereditary lues than the Wassermann; Cohen noted that the cutaneous test agreed with both the Wassermann and clinical signs; Namu-Muscel found that the luetin reaction was positive in 71 per cent of congenital luetics; a distinctive negative value, as it was negative in all non-syphilitics; Gordon obtained a positive reaction in 81 per cent of his congenital cases, and so on. The author found a positive reaction in 65.4 per cent as compared with 70 per cent, the average of most observers.

Describing the reactions he gives five distinct types: Papular, vesiculo papular, delayed or torpid, urticarial and hemorrhagic, the majority being of the papular type. After forty-eight hours there appears at the site of the injection a definitely indurated papule measuring from 5 to 15 millimeters in diameter, usually surrounded by a zone of redness, which varies in size. During the next three or four days the papule takes on a venous blood color lasting a number of days.

In the pustular type the indurated papule

appears in two or three days, soon takes on a vesicular appearance, central softening occurs and the lesion becomes a pustule, which on rupturing forms a scab, on separation of the scab a pigmented macule is left, which may persist for weeks.

In the torpid reaction the primary papule soon disappears and simulates a negative reaction, but in ten or twelve days it reappears as an indurated papule or pustule.

The injection should be made intra-cutaneously instead of subcutaneously and it causes no constitutional reaction.

Space does not permit reference to the involvement of individual organs. Suffice it to say that no tissue in the body is exempt from the ravages of syphilis, this being true of both inherited and acquired syphilis. A chondro epiphysitis as shown by the X-ray is often found in still-born infants of syphilitic mothers.

Green (Amer. Jour. Dis. Children, Vol. 20, No. 1) contributes a very exhaustive paper upon the subject of the eye in hereditary syphilis, and calls attention to the many references in the early medical literature on this subject, the earliest being in 1567. With the percentage of ocular involvement in syphilitic children varying from 39 to 48 per cent, the seriousness of the subject is apparent. Ocular lesions are rare in the new-born, the first signs appearing some weeks after birth, an explanation offered being the probable late intrauterine infection of the fetus. Fetuses which are infected earlier either succumb to the infection before birth or soon after. No portion of the eye seems immune against involvement, with a predelection apparently for affection of the cornea, sclera and iris.

The question of treatment of the syphilitic infant is a serious one and is approached in a half-hearted way by the average practitioner. The authors above referred to advise the intramuscular injection of neoarsphenamine and mercury given through a special needle to insure the proper location of the drugs in the gluteal muscle. Another method of treatment advocated is the administration of a full course of treatment to the mother during lactation.

If the infant is much under weight, with a poor musculature, mercury alone is given at weekly or by-weekly intervals until there is an improvement in the general condition, after which the injections of neoarsphenamine are begun.

Mercuric chloride is put up in palmitate in individual collapsible ampoules, in doses from 1-10 to 1-8 grain. Three or four days are required for absorption of the drug given

*Archives of Pediatrics, April, 1920.

in this way. The palmitate in its colloid state is solid at room temperature and at 110 degrees F. liquifies. An ordinary 19 or 20-gauge needle cut down to 1-2 to 1 inch in length is used.

The neoarsphenamine is put up in individual glass ampoules containing 0.1 to 0.2 g. m. and large enough to hold 5 cc. of solution, so as to dissolve the drug in the individual container after breaking the end of the ampoule under aseptic measures, from 2.5 to 3 cc. of sterile water is injected from a Luer syringe alternately expelling it, until the solution is clear.

Attention is called at this point to an explanation offered in a recent publication as to the cause of severe constitutional reactions following use of these preparations to be due to agitation of the undissolved drug in its diluent, in the presence of air.

A special needle is advocated so as to prevent the injection of the fluid in the subcutaneous and adipose tissue, containing a flange at its base curved so that its concave surface fits closely to the contour of the thigh.

These injections are advocated in series of six to eight at weekly intervals followed by rest periods of four to six weeks.

In this connection Ramsey and Groebner have made some interesting observations (Amer. Jour. Dis. Child, Vol. 20, No. 3) in regard to the amount of mercury eliminated in the urine of children, as a guide to the amount in circulation.

In infants and children mercury, when given by the mouth by inunction or intramuscularly, is excreted at least partly by the urine.

In new-born infants and older children mercurial ointment when placed in contact with the skin, without any friction being used (protected and sealed by wax paper from being volatilized and inhaled), is taken up by the skin and excreted in the urine for a variable time after all treatment has been discontinued.

By inunction with rubbing, mercury is readily taken up by the skin and excreted in the urine and continues to be eliminated for a considerable time.

When one inunction is given, the maximum daily amount of mercury is usually eliminated during the following twenty-four hours, smaller amounts being eliminated for a variable time.

Where continuous inunctions are given, there is an accumulation in the system and considerable amounts are eliminated at intervals with only traces between.

Mercury salicylate suspended in oil and

given subcutaneously continues to be eliminated in the urine in appreciable amounts for eight days or longer, the daily amounts eliminated varying widely.

Mercuric chloride by intramuscular method continues to be eliminated for eight days or longer.

In all cases in which mercuric chloride was used by mouth or intramuscular method protein was found in the urine.

Their practical deductions from these and subsequent experiments are as follows: Mercurial ointment, 50 per cent is to be preferred to the less concentrated forms and need not be repeated more often than twice weekly instead of daily. The quantity of mercury absorbed is much increased by friction.

Calomel ointment is absorbed, but less rapidly, and to a less extent than mercurial ointment, and should, therefore, be given in greater concentration.

The salicylate of mercury in oil should be given hypodermatically twice weekly instead of once.

The mercuric chloride, by hypodermic injections, although the dose is very small, continues to be eliminated for six or seven days. The fact, however, that its use is frequently followed by the appearance of protein in the urine, should exclude it from the treatment of syphilis in children.

Calomel by the mouth is absorbed in small amounts and continues to be eliminated for a considerable time, so that it is probable that it would be sufficient to give it at intervals of several days, thus avoiding diarrhea.

Grey powder is absorbed to a small degree and eliminated rather rapidly, so that large doses repeated daily would probably be necessary to maintain mercury in the circulation.

Hemorrhage in the New-Born.

It seems proper to call attention to this condition, as the hemorrhagic diathesis or tendency is frequently undiagnosed, if occurring other than from the gastro-intestinal tract or in the skin of infants. When intracranial, if the child survives, the subsequent paralyses are distressing to an extreme. Foote (Amer. Jour. Dis. Children, Vol. 20, No. 1) calls attention to the importance of early lumbar puncture when intracranial hemorrhage is suspected, which by lowering intracranial pressure is helpful, but this measure also confirms the diagnosis. The fluid withdrawn generally shows amounts of blood varying from deep to a light claret color and occasionally small clots. It is

important to remember that the intracranial hemorrhage may be but a manifestation of a general hemorrhagic tendency, bleeding occurring in many organs of the body. The writer has reported a case of massive hemorrhage into the suprarenal capsule. No organ is immune.

A further diagnostic agent is the coagulability of the blood, a much prolonged period being the rule in these infants.

As remedial measures the free use of human or horse blood serum and thromboplastin are recommended. Cushing (Amer. J. M. S., 1905) and Sharpe (Internat. clinics series 29) call attention to the relief of the after affects (paralyses or Little's disease) of intracranial hemorrhage by decompression operations, which do not preclude the administration of coagulation remedies.

Diphtheria Immunization.

No general discussion of pediatric topics would be complete without mention being made of the use of the Schick test for the purpose of determining the body's antitoxic immunity to diphtheria. In the application of this test, the subject is given an intradermal injection of 0.2 cc. of a dilution of pure diphtheria toxin representing 1-50 minimum lethal dose for a guinea pig. A negative Schick test denotes (Blum, Amer. Jour. Dis. Children, Vol. 20, No. 1) there is sufficient antitoxin in the tissues to neutralize the diphtheria toxin injected and therefore enough to protect the individual. A strongly positive Schick test denotes there is no antitoxin in the individual to protect him. To the positive and mildly positive reactors to the Schick test should be given injections of diphtheria toxin-antitoxin as advocated by Park and Smith. Three injections at weekly intervals of 0.5 cc. in infants and 1 cc. in children over 1 year of age are given in the arm about the insertion of the deltoid. Blum's statistics are convincing. He did the Schick test in 1,676 children in an institution over a period of five years and he has concluded that it is a reliable test; that the same child should be re-tested at least every three months, as an active immunity may run out during that time, and that the immunity conferred by injections of the toxin-antitoxin lasts for at least twenty-two months.

Pneumonia in Children.

Herman (Amer. Jour. Dis. Children, Vol. 20, No. 2) gives a summary of 336 cases of pneumonia at the Mt. Sinai Hospital during 1918-19. Of 336 cases, 288 were bronchopneumonia, with a mortality of 17.7 per cent; 48 lobar pneumonia, with a mortality of 10.4 per cent. The autopsied cases showed

the left lower lobe the most frequent site involved, and hemorrhagic foci were common. The Roentgen-ray was found of invaluable aid in diagnosis of both localization and type of the pneumonia, in eight cases showing the site and type of the lesion when no physical signs could be found. A blood count was found of value especially as to prognosis. A low leucocyte count and low polymorphonuclear count showed poor resistance. Otitis media was the most frequent complication, empysema next, and meningitis next.

The Duct Sign in Mumps.

Cowie (Amer. Jour. Dis. Child, August, 1920) describes a diagnostic sign in mumps which he terms the duct sign. By separating the buccal mucous membrane from the teeth and view in a good light, the orifice of Steno's duct on the affected side or sides will present a reddened spot measuring 1 to 2 mm. in diameter. The duct will be found to be teatulated and to project beyond the surface of the mucous membrane, from 1 to 3 mm. It is edematous, and pale, accentuating the red central spot, which at times gives the appearance of a minute ring, because of the central opening which may appear darker. Minute hemorrhagic spots may be seen scattered over an area surrounding the duct as great as 2 mm. in diameter.

The red spot usually first appears followed by teatulation. The redness varies in shade from a faint pink to a deep inflammatory red.

The author found the duct sign in 96 per cent of 57 cases of mumps, and advocates it as corroborative evidence of parotid gland involvement. As the sign is present early it should be looked for in all children exposed to mumps so that an early tentative diagnosis can be made in order to sooner remove the child from contact with other children.

Pyelitis.

This condition is a most important one and frequently goes undiagnosed, principally, because so few practitioners insist upon a minanalysis being made in acute illnesses in infancy and childhood. The difficulty in obtaining a specimen of urine from the baby may be partly responsible for the neglect, yet should not be a barrier against complete diagnostic methods in all cases.

While it has been said that "pyelonephritis" in children disappears spontaneously in the course of time in practically every case,* I would not advocate non-interfer-

*Braasch, Jour. A. M. A., Vol. 75, No. 20, page E305.

ence in these cases looking forward to a spontaneous cure sooner or later. Any infection in a child, no matter if self-limited, is a serious condition and should receive prompt and careful attention.

Administration of urinary antiseptics in the presence of an acid urine, alkalis, free use of water usually results favorably in a comparatively short time. It may result in a cessation of the acute febrile and some local symptoms, yet the urine remains full of pus and debris. In such cases Kretschmer and Helmholt (Journ. A. M. A., November 13, 1920) advocate the treatment by pelvic lavage, and emphasize the fact that it can be done at any age, better, however, in infant girls than boys. Silver nitrate is used 2.5 to 3 cc. of a 0.5 solution, with no reactions following, this procedure rendering the urine free of pus, and sterile.

In a series of nine cases, which have resisted other forms of treatment, the results were perfect and there were no complications or unfavorable results. The chief difficulty against the urologist being called upon to treat these cases is the fact that the procedure requires a general anesthetic. Usually not more than two injections are needed to effect a cure.

DISCUSSION.

Philip F. Barbour: Dr. Tuley is very modest in describing the work he has accomplished at the City Hospital in the salvation and welfare of children. When the Southern Medical Association met here recently some of the pediatricians who visited the hospital stated they were surprised at the excellent work which was being done in the nutritional clinic, the pre-natal clinic, and in the general care of children. I think from observation made to me it is far in advance of anything that it is being done in many of the cities, and Dr. Tuley deserves the credit for having inaugurated and continued this fine work. Of course, everyone has to realize that the infants and children of today are the future men and women of the race, and they are entitled not only to be born well and healthy, but they must be properly cared for during infancy and pre-school age, and while they are attending school. All the health boards are now undertaking the observation and control of children so that in the next generation we shall have a stronger race of people than ever before.

As to spasmodophilia: While the essayist stated this is not inherited, yet in spasmodophilic children I have nearly always found an underlying history of lowered self-control in the parents. I think the nervous, excitable mother who cannot control herself is more apt to have a child with a spasmodophilic tendency than a normal woman. This is a part of the penalty the higher civilization of woman has to pay. In families there are certain children who with the slightest variation in temperature will have spasmodophilia; I know such families are classed among the highly neurotic.

Dr. Tuley spoke of the various manifestations—

tetany, laryngismus stridulus, etc.—but said nothing of the connection between the para-thyroids and the so-called spasmodophilic tendency. Some recent observers claim in these cases there are evidences of disturbance of the thyroid secretion. The lime salts are beneficial in such cases, and I think they should be pushed so far as the child is able to tolerate them.

The diagnostic point mentioned in connection with mumps is one that has been noted before. Cowie has tabulated the greatest number of cases of this character which he has examined and found the duct sign present, but this point was mentioned several years previously. Holt described an important diagnostic point in mumps, i. e., swelling of the gland anteriorly, posteriorly, and inferior to the external auditory meatus. The gland also swells externally to the ramus of the jaw. I have never seen such swelling of this gland result from anything else except mumps and regard it as a reliable diagnostic point. Many observers diagnose enlargement of the cervical glands as mumps. However, mistakes in diagnosis will be rare if one remembers the exact location of the parotid gland.

Pyelitis is an exceedingly common affection in childhood; and I was about to say this is an exceedingly useful diagnosis to make when one is in doubt as to the real condition present! Pyelitis has seemed more common in children especially since the influenza epidemic two years ago, and in almost every case where the urine is examined there will be found some evidence of pyelitis. However, when making the diagnosis, we must remember that pus in the urine does not always mean pyelitis. I have never had a specimen of urine from a child with acute infectious disease examined that pus was not found in it. So the presence of pus alone in the urine does not make the diagnosis of pyelitis. DeBuys, of New Orleans, has mentioned what seems to me the most reliable diagnostic point, i. e., when pus in the urine is "clumped" then the patient has real pyelitis; if the pus cells are separated, not clumped, it is not pyelitis.

One of the most important features in treating pyelitis in children is to improve the condition of the intestinal tract. Practically all the cases of pyelitis we see in children are due to colon bacillus infection. It would seem to me that the colon bacillus infection must get into the blood from a lesion in the alimentary tract. In cases of pyelitis from colon bacillus infection, in addition to the administration of helmitol, urotropin, etc., for their effect upon the kidney, it is important to improve the condition of the mucous membrane of the intestine. In all the cases of this kind I have seen the patient has passed quantities of mucus with the stool; not with every stool, but frequently the child would pass a tablespoonful or more of mucus from the intestine. I believe in these cases it is important to restore the mucous membrane to its normal condition so as to prevent reinfection of the kidney by the colon bacillus.

Gavin Fulton: The essayist has covered a subject of great interest from every standpoint. I agree with practically everything he has said.

Pyelitis in children is not always a trivial disease. I recall three or four cases in little girls seen during the last two or three years that proved to be very serious. The first one began as a simple pyelitis, which was probably the result of gastro-enteric disturbance; but in this case

there was a peculiar blood pressure. The pathologist who first examined the blood thought perhaps the child had splenic leucemia; the leucocyte count on several occasions was reported as 50,000, and once nearly 100,000; the child was desperately ill for a long period. It proved to be a case of severe colon bacillus pyelitis. After a long siege, alternating between helmitol, urotropin, potassium citrate, alkalis, etc., we finally resorted to cacodylate of sodium in small doses given every other day. This was followed by improvement and the temperature receded. The child was greatly emaciated and we thought for a long time she would die. However, she finally recovered, but during the next ten or twelve months at intervals the child would have fever and colon bacilli were found in the urine. After giving potassium citrate or urotropin for a few days the urine would again become clear and the fever then subsided. The child was desperately ill; there were no other complications; the blood picture was most unusual; she finally recovered and has remained well.

The second child is now three years old, the initial attack of colon bacillus pyelitis having occurred when she was six months of age. Her temperature was 105 degrees to 107 degrees F. for ten days. That was two and a half years ago. This child is apparently healthy today, although from time to time she has had furuncles which have to be opened and drained; the blood investigation has not shown anything significant. Her urine is examined at frequent intervals. Occasionally she has a recurrence of the colon bacillus infection, the urine shows a little albumin with clumping of the pus cells, etc., and she will then have a new crop of furuncles which have to be opened and drained. Under alkaline treatment for a few days she will improve for a few weeks and then have another recurrence of symptoms.

The third child is five years of age, a diagnosis of colon bacillus pyelitis having been made nearly three and a half years ago. She has been under my care for a year and still has recurrences, which I believe are due to gastro-enteric disturbances.

Cases of pyelitis in children are not always as simple as we have been led to believe, and it usually takes these children a long time to get well. I am not prepared to state just when they are absolutely well.

James W. Bruce: Dr. Tuley has covered the developments in pediatrics during the past year very thoroughly. He is to be commended for the splendid work being done at the City Hospital and the great improvements he has made. As Dr. Barbour has said, this was especially noticed by the members of the Southern Medical Association at their recent meeting here.

Spasmophilia is probably one of the most interesting questions in pediatrics today. Certain authorities claim that all convulsions occurring in infants under two years of age are due to latent spasmophilia or latent tetany, except those convulsions due to an organic nervous lesion. That is going too far, it seems to me. Dunn, who is one of the best pediatricians in this country, states that any convulsion in a child under two years of age where no organic lesion can be demonstrated, is due to spasmophilia.

What causes spasmophilia is not definitely known. It occurs more frequently in the winter months when children are in houses with poor

ventilation and where there is no chance for exercise, and yet these conditions alone do not seem sufficient to cause it. Spasmophilia seems to have nothing to do with the vitamins. Dr. Tuley has told you about the work which has been done along that line, showing that deficiency of water or of fat soluble vitamins has nothing to do with the cause of spasmophilia. It seems to me the most likely explanation is a lack of balance between the salts of calcium, magnesium, potassium and sodium. It is known that spasmophilia is particularly uncommon in breast-fed infants; also that calcium and magnesium are present in much smaller quantities in breast milk than in cow's milk. The reason that the child loses calcium when fed on cow's milk is supposed to be this: that the calcium forms an insoluble soap which is not absorbed and is passed with the stool. We know that in the stool from cow's milk there is always a large deposit of these calcium soaps. In this way the balance is destroyed between calcium and magnesium on the one hand, and sodium and potassium on the other. Calcium and magnesium are sedative to the nervous system, while sodium and potassium are irritating to it. In the healthy child these salts form a perfect balance. When therefore, calcium and magnesium are lost in the stools, the balance is destroyed and the nervous system becomes oversusceptible to outside stimulation. Otitis media, pneumonia or shock of any kind will cause convulsions due to the imbalance of salts in the body.

In this connection, the action of cod liver oil in retaining calcium in the body is interesting. It has been known for a long time that cod liver oil is a most valuable remedy in the treatment of rickets and spasmophilia. Rickets is due to lack of ability on the part of the body to retain calcium, and spasmophilia may be due to the same cause, as in almost all cases of spasmophilia evidences of rickets are also found. On the other hand, however, evidences of spasmophilia are not found in all cases of rickets.

The work to which I refer on the blood calcium was done by Brown, of Toronto. He has shown that the administration of cod liver oil over a period of three weeks will make the child retain calcium, the blood calcium being raised to normal. Some excellent work has also been done by Howland, of Baltimore, who has proven by Roentgen-ray examination of the bones that a short time after beginning the administration of cod liver oil calcium is deposited in the bones. This shows that cod liver oil has the ability of making the child retain calcium, whether or not it is due to the calcium soap forming a more soluble combination I do not know. In any event, cod liver oil does help to retain calcium, therefore it seems to me it should be given in all cases of spasmophilia and rickets just as is being done.

Another interesting thing Dr. Tuley mentioned is the work which has been done during the past year on congenital syphilis. Jeans, of St. Louis, has practically made a life work of this disease and has reported some wonderful results. Congenital syphilis is an affection in which we have not accomplished very much by medication. Mercury alone does not seem to control it. Jeans has reported a rather large series of cases and states that mercury alone does not seem to effect a cure. He has never been able to get the Wassermann negative with mercury preparations. However, he has developed his technique so he is able to give arsphenamin just as well to infants as to

adults, and he is giving a certain amount of it through the sinuses. It is dangerous to introduce neocarsphenamin into the longitudinal sinus; a very small amount of it getting into the cerebrospinal fluid of the infant will cause death; in fact, many fatalities have occurred from this method of treatment. It is difficult in the child to introduce a needle into one of the arm veins; a skillful operator may be able to enter the jugular, but even that is difficult; sometimes a needle can be introduced into the temporal vein, and that is probably the safest plan. However, it has been shown that a very small dose of neocarsphenamin can be injected into the muscles and not cause a great deal of irritation, and that appears to be the best way to give it. The drug should be administered in small doses, not more than $\frac{1}{2}$ to 1 decigram, injected into the muscles weekly or at ten-day intervals. As Dr. Tuley has said, mercurial ointment is probably the best method of giving mercury, using 50 per cent strength twice per week well rubbed into the skin. This seems to be the best way to administer mercury in infants.

W. J. Young: I want to supplement what Dr. Tuley has said in regard to the importance of the pre-natal clinic and also the nutritional clinic at the hospital, and to call attention to the fact that this work was inaugurated by him.

In the skin and syphilis clinic we have sent to us a large number of women who are about to become mothers. Where a positive blood Wassermann is obtained we institute intensive treatment, in some instances giving arsphenamin twice per week, and in no case has an abortion been produced by this treatment. We can promise these women that by proper medication they will be able to give birth to living children. Of course, they will have syphilitic children, but they will not be the typical weasen-face babies with snuffles, which are so frequently seen born of syphilitic mothers.

In regard to the treatment of syphilitic children at our clinic: We almost invariably employ the method of injecting arsphenamin into the external jugular vein, and we have had very little difficulty in doing it. The infants are made to cry by gently slapping the feet or buttocks; the jugular vein becomes prominent and the needle can be easily inserted. Care should always be observed to inject arsphenamin slowly into the jugular vein because it practically goes direct to the heart under such circumstances. In children over three years of age we usually make the injection into a vein of the forearm.

I agree that mercurial ointment is the best method of administering mercury to infants.

Leon K. Baldauf: Several years ago I was particularly interested in tetany and the various forms of dorso-pedal spasms. Archambault, who is one of the best neuro-pathologists in the country, worked out the pathology in a few of these cases. After a very careful examination of a number of sections we came to the conclusion that there was no distinct or characteristic lesion in tetany or in carpo-pedal spasm. These lesions found then are especially interesting to me now in view of the pathologic work that has been done by others recently in encephalitis lethargica, which showed that the pathology of tetany, carpo-pedal spasm and allied conditions and encephalitis lethargica was practically identical.

Dr. Bruce has mentioned some of the work of Howland, of Baltimore. To me one of the most important pieces of research work done in years

has been that of Howland and Marriott on tetany in children. They showed that in tetany the calcium of the blood is very much decreased, that by feeding these patients a certain amount of lime that it is absorbed very slowly and that in time the symptoms disappear. It is a well-known fact that the absence of calcium salts gives rise to a state of spasm. For instance, where we operate upon the thyroid and by chance happen to remove some of the para-thyroid glandular structure, the patient develops convulsions and there is an increase of calcium in the urine and feces, but on the administration of calcium salts the convulsions are relieved. It is known that if animals are deprived of calcium for a long period they develop muscular twitchings. It has been shown experimentally that if animals be fed on foods absolutely devoid of calcium salt they will develop a state of tremor. Recently some observers have attempted to make use of this fact in the convulsions of uremia and have administered calcium salts by intravenous injection. I do not know how successful this treatment has been in relieving the uremic convulsions.

I wish Dr. Tuley would tell us in closing what is the present opinion in regard to the intravenous administration of antitoxin in diphtheria.

J. Rowan Morrison: It must not be forgotten that much of the pediatric practice in this part of the country is done by general practitioners of medicine, and I do not believe they always keep abreast of the work that is being done along pediatric lines. Under these circumstances possibly they accomplish less than could be done by the trained pediatrician.

In regard to spasmophilia: Dr. Tuley emphasized one thing upon which I want to also lay stress, i. e., that spasmophilia never occurs in breast-fed infants. I want to make another plea for trying to feed as many babies as possible on the mother's breast. This question was raised at the Lexington meeting of the State Medical Association and I was called "old-fashioned" for insisting that mothers' milk was the best infant food. Breast-feeding is very important. Sedgewick, of Minneapolis, has estimated that about 90 per cent of infants are at present being fed on artificial foods. In my work in connection with the Babies' Milk Fund I have seen many infants taken off the breast for the most asinine reasons. No effort seems to be made to keep the babies on breast milk. Nurses have told me that babies would not nurse at the breast at first, but this can be easily corrected after a few trials and a little patience. It is true that some babies do not get enough milk from the mother's breast, and in such instances it is necessary to give supplemental feeding with fresh cow's milk.

The statement needs no further emphasis that there will be no spasmophilia if all babies are nourished at the mother's breast. This ought to be very seriously considered by everybody who has to deal with children before taking them off the mother's breast.

As to congenital syphilis: I have several questions which I wish the pathologists would answer. In an excellent article by DeBuys, of New Orleans, read before the section on pediatrics of the American Medical Association for 1919 he said that in a number of instances in New Orleans they were unable to get a positive Wassermann reaction in young children, although they had tests made by several competent pathologists. I have asked several excellent pediatricians about this and they thought a positive Wasser-

mann reaction could be obtained in children. I have heard pathologists say they thought the question of whether the Wassermann was positive or negative in a child under one year of age did not amount to very much. I would like to have some of the pathologists present explain these discrepancies.

Dr. Tuley and the City Hospital staff deserve great credit for the excellent work being done in the pre-natal clinic. This is a class of work which will do a great deal of good by the treatment of both mothers and children. Neoarsphenamin may be administered to infants with beneficial effect, but in my experience mercury ointment well rubbed into the skin five or six times a week and continued for a sufficient length of time has produced wonderful results. I have had an opportunity to follow some of these patients from infancy to the age of six or eight years and they have remained perfectly well. I have never yet seen one of them salivated from mercury injections. I have also administered syrup of the iodide of iron in congenital syphilis with good effect.

About the Schick test in diphtheria: This is of great value, especially when dealing with children in the various institutions. We must not only consider the Schick test, but also the toxin-antitoxin preventive treatment, because diphtheria is a very dangerous disease, particularly when it once gets started in an institution.

I. A. Lederman: Concerning Dr. Tuley's reference to the eye manifestations of congenital syphilis: I am aware that a number of cases have been reported, but my personal experience has been that eye manifestations are rare in infants with congenital syphilis.

Later in life eye symptoms of hereditary lues are noted quite frequently, such as interstitial keratitis, choroidal lesions, etc., the latter condition usually coming to our attention after the child begins to use the eyes. We see intra-ocular lesions in routine examinations for glasses, etc., in older children, but personally I have seen very few eye manifestations of syphilis in infancy.

Stuart Graves: There have been a great many improvements at the City Hospital since Dr. Tuley took charge, but I do not know of any department for which he deserves more credit than the pre-natal clinic. Of course, any city hospital is more or less a catch basin for the poor and ignorant, most of whom can only secure alleviation of suffering temporarily; but in the pre-natal clinic we have to deal directly or indirectly with future citizens. For this reason more good can be done with future promise than in any other department. For this reason also the work at the pre-natal clinic should particularly be given the hearty support of the profession and the general public; the latter will do so if influenced by the profession.

Answering Dr. Morrison's question, positive Wassermans are sometimes obtained in children a few days old, but it has been shown positively that children with undoubted hereditary syphilis sometimes give negative Wassermans in the first ten days of their lives and afterward give positive Wassermans. Sometimes placental blood is negative and the blood of the child gives a positive Wassermann after two weeks.

Owsley Grant: In regard to pyelitis in children: I agree with Dr. Barbour that no one should make a diagnosis of pyelitis simply because pus is found in the urine. The cases that

we ordinarily consider pyelitis are those where considerable pus, some blood, and in addition to that bacteria are found in the urine.

I have read the article by Kretschmer which was mentioned by Dr. Tuley. The criticism of Kretschmer's position is that the cases of pyelitis he cures with one or two injections would probably be cured by medical treatment properly applied, though they had resisted some medical treatment previously. Kretschmer bases his results finally on the fact that the urine becomes sterile after one or two injections of silver nitrate. It is a fact that nearly all these cases are in little girls. This suggests that the infection might not have occurred through the intestinal tract but from the rectal secretions as an ascending infection from contamination through the short urethra.

Another thing that is suggestive about little girls having pyelitis is the statement of Hunner, of Baltimore, who works in the female clinic of one of the large hospitals. He has reported five hundred cases of stricture of the ureter in women. It is significant that nearly all cases of pyelitis in children occur in little girls, and nearly all the strictures of the ureter in older people occur in women, therefore there may be some connection between them.

One other thing of importance not generally recognized by the profession, in both older and younger people, is the utility of administering urotropin except in the presence of an acid urine. In the pyelitis of infancy the urine is usually alkaline, and under such circumstances no good can be accomplished by the administration of urotropin. "You are not only wasting your urotropin, but are deluding yourself at the same time."

In regard to congenital syphilis: I have recently had some experience in the administration of neoarsphenamin by the rectum in this class of cases. It is often a difficult matter to find the veins in a child even five years of age, therefore the intravenous administration of the drug is not altogether satisfactory. It is also disastrous sometimes to give neoarsphenamin in the buttock, because it often produces considerable sloughing. For these reasons we have recently made it routine to give the drug per rectum where there was difficulty giving it intravenously. It is retained very well and, of course, is rather slowly absorbed, but it seems to me the method is indicated in young children. I have seen some very good results from this method of giving neoarsphenamin in the very young.

S. G. Dabney: In referring to the eye manifestations of congenital syphilis, Dr. Tuley mentioned the iris, sclera and cornea. I think it is extremely rare to have the sclera involved as a result of congenital syphilis. Inflammation of the uveal tunic, the iris, choroid and cornea is far the most frequent. I have never seen a case of iritis in an infant, but have seen one case in a child under three years, the result of inherited syphilis.

I have been particularly interested in those cases that come to us between the ages of six and twelve years with interstitial keratitis and Hutchinson's teeth. In asking the parents whether or not the child was healthy early in infancy they nearly always state that, so far as they know, the child was all right. So far as I can ascertain from observation children with inherited syphilis manifesting itself between six and twelve years

do not give a history of early symptoms. That has always been interesting to me.

Dr. Tuley said nothing about snuffles. I presume there has been nothing new on that subject during the past year. It is common in inherited syphilis. I have seen it interfere with the child nursing at its mother's breast. While local treatment of snuffles does not amount to a great deal still it helps. I generally advise the mother to drop into the nostrils of the child several times a day a drop or two of a 1 per cent solution of oil, such as peppermint or eucalyptus in alcohol. The most important feature is early antiluetic treatment.

Henry Enos Tuley (closing): In regard to pyelitis in children and the remarks of Dr. Grant: I was particularly anxious that he say something about the genito-urinary phase of the subject. I do not agree entirely with him concerning ascending infection in these cases. My experience has been that pyelitis is not often seen in nursing; the disease usually occurs in older children after the diaper has been discarded.

It is in cases such as mentioned by Dr. Fulton that it has seemed to me the suggestion of Kretschmer might be of service. While I have not seen any children with pyelitis treated in that way, yet his suggestion may be of value in intractable cases of known colon bacillus infection which has persisted in spite of other methods of treatment. It seems to me that lavage according to the method described by Kretschmer would be worthy of trial in such cases. The only objection mentioned by Kretschmer is that a general anesthetic is necessary. I believe in girls two or three years old lavage could be practiced without any especial difficulty.

Dr. B. B. B. B.'s statement that the diagnosis of pyelitis should not be made simply because of the presence of a few pus cells in the urine is important, and I agree with him fully. I think in no case should the diagnosis of pyelitis be made where pus is found in centrifugized urine. We may be misled as to the amount of infection in such cases, because pus is nearly always found in the centrifugized specimen. In any case, however, where there are forty to fifty pus cells to the field from uncentrifugized urine it would be very suspicious.

As to Dr. Baldauf's question about the use of antitoxin intravenously: I have had no experience with this method of treatment. I have always been afraid to use antitoxin in that way. It seems to me that any foreign protein introduced into the circulation in the quantity that we give diphtheria antitoxin, say 10,000 units, might be harmful to the patient, and there would also be danger of anaphylaxis.

I think the Schick test is one which we should all use more frequently. We have recently tested over four hundred children in one of the institutions of Louisville and found only two suspicious reactions, which I think speaks very well for the health of the inmates of that institution—and this is confirmed by clinical experience, there having been very few cases of diphtheria.

The Schick test can be made very readily and we are in position to give the injections at the City Hospital at any time in cases among poor people, and we should be glad to have the members of this society refer such cases to us.

The possibilities of child conservation through an organization such as we have at the City Hospital, if we had more money to be used in the work, would be very great indeed. I was

much gratified to see recently that one of the many benefactions of the Rockefeller Foundation was the donation of sixty million dollars to develop child welfare work and assist in the care of poor mothers. We hope to eventually get some of that money for Louisville. Our aim will be to divide the city into districts with an adequate personnel for each and thus be able to do 100 per cent work. There are undoubtedly many births which are not reported to the health office, especially among the very poor and ignorant classes, and by careful inspection by trained workers in this line we ought to be able to find these cases and see that they are reported and to follow them through the nutritional clinic. In this way we could do 100 per cent work and follow these children through the first one or two years of their lives and obviate many deaths which are preventable.

Probably many of you heard the admirable address by Dr. Knox, of Baltimore, before the Jefferson County Medical Society a few weeks ago. He outlined in detail the result which could be accomplished if child welfare work was properly handled.

We hope also through the efforts of Dr. McCormack, who is now in Washington, to get some money from the United States Public Health Service for the work in the pre-natal clinic especially along the line of the prevention of syphilis. There is a great deal of work being done by the government along the lines of venereal prevention and cure, and we believe some of the money appropriated will be available to properly organized clinics for follow-up work and laboratory investigations which are necessary items in pre-natal clinics. There are a number of such clinics organized in large cities and we believe we have a very excellent one at the City Hospital. For instance, yesterday thirteen new cases reported to the pre-natal clinic. That means these thirteen mothers, some of them late in their pregnancy, but the majority of them early, will be carefully watched in every way throughout the course of their pregnancy. Routine Wassermann examinations and smears for gonococci will be made in every case. We believe we will see some good results from this line of work. If we can obtain money from the Rockefeller Foundation and also from the Public Health Service we will be able to enlarge our organization and do the necessary follow-up work, which is a very important item. In some instances, even where the Wassermann is found positive, the patient fails to report to the clinic for intensive treatment. If we could follow such patients in their homes by using the police power which we have under the law to get them to return early for treatment we could accomplish more good; but we cannot do this without money to enlarge our follow-up system.

My idea would be for all this work to be placed in charge of the Public Health Nurses' Association and to furnish them the necessary facilities for handling this child conservation plan. I believe this would result in a great deal of good.

Onset of General Paresis.—Mirallie reports that a woman of 3 had been presenting symptoms suggesting tabes for three years, when suddenly parietic dementia developed, fatal in less than four months. A similar sequence was noted in ten other cases, but certain other slight symptoms in three suggested general paresis from the first.

A NEW OCCUPATIONAL PAIN—A CASE OF CHOREA; REORT OF CASES.*

By JOHN J. MOREN, Louisville.

J. J. D., aged forty-eight years; railroad mechanic; healthy man. No history of accident nor illness of importance. During January, 1920, this man began to complain of pain in his right elbow; in May the left elbow became involved. Has had all kinds of treatment; even went to the springs for a number of weeks without relief.

The patient was referred to me in October. His complaint is pain about the insertion of the biceps and the supinator longus noted on flexion of the elbow. Pronation and supination while elbow is fixed causes the same pain. He suffers a great deal of pain after he quits work. There is practically no pain on extension. The pain sometimes radiates up and down the arm. No particular portion affected more than another. Contraction of the muscles by the electric current produces the same pain as on voluntary flexion of the elbow. Physical examination negative.

On making inquiries as to occupation I found that he was handling a compressed air motor drilling holes in various pieces of machinery. His position in the use of this air motor was one of flexion of the arm, lifting the weight and at the same time holding it in position, and was accompanied by more or less vibration. In the absence of physical findings and his pain being so definitely located and followed the use of his flexor muscles, I thought that it was attributed to his occupation.

A few days later I met an official of the Louisville & Nashville Railroad Company and told him of this case. He informed me that at the shops where they use these compressed air motors quite a number of men suffer from similar pains.

I believe this man is suffering from an occupational pain. For the last six weeks he has been working but not using the motor; one arm is very much better and the other troubles him less than it did in October. He has had no medicine.

G. L., female, aged 10 years, reported at the office October 29, presenting typical symptoms of a mild chorea which appeared rather suddenly three or four days previously. She was placed in bed and ordered 5 drops of Fowler's solution, increasing one drop each day.

On November 4 she began with very violent choreic movements, with a temperature of 100 degrees F. Fowler's solution was discontinued and aspirin, 5 grains, three times a day ordered. By the 5th the child was almost a maniac, screaming, jerking, and was ordered a grain and a half of luminal for sleep. This had no effect.

On the 6th, codeine, 1-2 grain doses were ordered; temperature at noon, 101 degrees F.; 3 grains of calomel given at bedtime with good results. Temperature next morning was 99 degrees F. Began the use of acetanilid with the hope that it would influence the choreic movements.

Night of the 7th had to resort to morphine 1-8, atropine 1-150 hypodermic, slept at intervals during night. During this time aspirin had been continued, and on the 8th temperature rose to 101 degrees F.; patient very restless. Movements very severe.

On the 8th, whiskey; drams two every three hours, was ordered. The movements became very much quieter shortly after first dose and she slept six hours that night, with the addition of bromide and chloral. On the 9th temperature 103 degrees F.

On the 10th Dr. Kahn opened superficial abscesses on the back and left arm. During the severe movements the child simply wore the skin off of all exposed parts of the body. All efforts were made to prevent infection, and why these two places should become infected I cannot explain.

On the 11th her temperature receded to 100 degrees F., and on the 12th to 99 degrees F. The child rests splendidly, the choreic movements are only noticed on attempting to use the arm or legs. Of course, she is exhausted, but mentally she is clear and bright, altogether doing very nicely indeed.

Note.—November 23, 1920. Patient is doing fine, skin all healed, resting well, but choreic movements still persist on effort or mental excitement.

DISCUSSION.

F. C. Simpson: I first saw the patient mentioned by Dr. Moren on Friday of last week

*Clinical report before the Louisville Medico-Chirurgical Society, November 26, 1920.

and never saw a child have more severe contortions. Dr. Moren asked me to see her again on Monday. I believe on Friday and Saturday the child had choreic insanity, which explained the temperature elevation then present. However, the fever later manifested was probably due to pus formation.

I suggested to Dr. Moren that the child be given bromide and chloral—five grains of the former and fifteen of the latter. In some cases large doses of bromide and chloral will cause cessation of choreic movements, but, of course, these drugs are not curative. I do not believe anything will cure chorea except arsenic, which I understand Dr. Moren is now giving this child.

I was in the institution yesterday and never saw such a change in a child. She was lying in bed and seemed to be comfortable, she was quiet and in a happy frame of mind, talking, laughing, etc. Anyone seeing the child yesterday could scarcely appreciate her condition on Monday owing to the marked change which had occurred.

Dr. Moren claims the result was due to the administration of whiskey—and he may be right.

Henry Enos Tuley: I wish to speak of only one point in connection with the case reported by Dr. Moren: I do not see any reason why tonsillectomy should not be performed during acute chorea. I believe the tonsil is the starting point of more cases of chorea than we have hitherto believed.

I am unable to understand how whiskey can cure chorea.

Leon K. Baldauf: While it may be unfair to those who have seen the case to offer any comment on the diagnosis, yet it is a question in my mind whether the child referred to by Dr. Moren actually had chorea. We know infections perform "queer stunts" at times, and may it not be that the contortions, convulsive movements, etc., were the result of the absorption of pus, and that surgical removal of the pus was responsible for the improvement noted in the condition of the patient?

John J. Moren (closing): There can be no question as to accuracy of the diagnosis in the case reported. The child had typical choreic manifestations, which are difficult to describe, but when once seen are never forgotten. When the temperature began to rise it was thought the manifestations might be due to encephalitis, but the contortions accompanying encephalitis cannot be compared to those due to severe chorea.

I do not believe the symptoms were due to infection, as the child had been perfectly healthy, furthermore the record shows there was no fever for six or seven days during which choreic manifestations were marked. The temperature then rose to 100 degrees F., and continued to rise after that.

I think the whiskey caused relaxation and in that way probably enhanced absorption of the other drugs administered.

Tumors of Bladder.—Three carcinomas, three papillomas and one condyloma of the bladder are reported by Danforth and Corbus. They emphasize the necessity of remembering that syphilitic growths may very closely simulate carcinoma and that careful observation may be needed to distinguish between them. They also call attention to the value of radiotherapy as an adjunct to operative measures.

FOREIGN BODIES IN THE EYE—REPORT OF FOUR CASES.*

By ADOLPH O. PFINGST, Louisville.

The rather strange experience of seeing four cases of perforating injury of the eye in one week at my office prompts the report of these cases. They present some features in common and each one has some special feature of interest.

Case 1. A male, aged thirty-two, referred by Dr. Moreman, of this city, who, when seventeen years old, lost his left eye from what he believed to have been a non-perforating wound. A year and a half ago this man injured his right eye with a piece of steel. He believed that a very small piece struck the eye, though he did not know whether it perforated the eyeball. After the accident he was unable to see for several months, but there was a gradual improvement in vision until he was able to get about and was able to do some work.

When I saw this man he had a shrunken left eye, though no scar indicating a point of perforation was visible. The vision was *nil*. His right, or more recently injured, eye showed a membrane across the pupil, evidently the result of absorption of the lens substance and a thickening of the lens capsule. As he showed a small scar near the middle of the pupil it seemed reasonable to assume that this man had suffered a perforating wound and that a small foreign body had injured the lens in its passage into the interior of the eye, causing it to become cataractous and finally to be absorbed. However, x-ray examination made by Dr. Keith revealed no foreign body in the eyeball, though, strange to say, a foreign body one-half inch long and one-fourth inch wide was found, apparently just inside the orbit near the external, angular process. This could hardly have had anything to do with the development of the cataract as a result of a direct injury, though the traumatism could have dislocated the lens which finally became cataractous.

The indications in this case is the removal of the left eye and a division of the thick pupillary membrane in the right in the hope of increasing vision in this eye, which now has 20-200 vision.

Case 2. A male, aged twenty-nine, referred by Dr. W. R. Cundiff, Stearns, Ky., was shot with a shotgun by a man about thirty feet away from him and as far as he

*Clinical report before the Louisville Medico-Chirurgical Society, December 10, 1920.

could judge, from the right side and somewhat from behind. He gave the history that the right eye became blind immediately after the injury. There was no pain nor other symptoms. Examination of the right eye when rotated inward showed far back in the sclera a raised red point just opposite the outer canthus and corresponding to a scar in the skin just outside the canthus. This point was evidently the point of entrance of one of the shot. The vitreous in this case was filled with blood, as was evidenced by the loss of light reflex. He had only a perception of light. It is rather an interesting feature that in this case the x-ray also showed no foreign body in the eyeball. The foreign body had evidently passed through the eye and lodged in the side of the nose opposite the point of injury, as can be seen by the plate. This eye was not removed and offers some hope, not only of retaining the ball, but also some vision.

Case 3. A boy aged eleven years was sent to me by Dr. Whetzel, of Bloomington, Ind., with the history that the boy was driving a staple over a 22-cartridge when an explosion occurred and something struck him in the right eye, presumably a piece of the shell. In this case we could see the point of entrance of the foreign body slightly to the temporal side of the cornea over the ciliary region. The vitreous was cloudy, no light reflex. He had a bare perception of light. The x-ray showed the foreign body very distinctly. It was about as near the middle of the eyeball as it could be—vertically, horizontally and antero-posteriorly. Unfortunately, the giant magnet was of no service in this case, as the body was copper and consequently non-magnetic. After obtaining permission to remove the eyeball, in the event of failure I made an attempt to remove the foreign body by making a stab wound in the sclera near the middle of the globe and above the external rectus muscle, introducing a pair of capsule forceps to as near the middle of the vitreous chambers as I could get it. Two or three attempts were made by opening and closing the blades to grasp the body, but as was expected, I failed to find the foreign body. The eyeball was then removed. A thin curved piece of copper about one-fourth inch in diameter was found in the vitreous mass.

Case 4. A boy aged six years, referred by Captain Ellis, of Jackson, Ky., with the history that eight days previously while he and a companion were striking a hammer and hatchet together "to see the sparks fly," a small particle of the metal struck this boy in the eye. On examination the point of en-

trance could be plainly seen in the middle of the cornea. He had in that short time (eight days) developed a traumatic cataract. There was a perception of light. This was a most interesting case, so far as the x-ray examination was concerned. Dr. Keith located the foreign body, which was not larger than the head of an ordinary pin, about one inch behind the surface of the cornea by means of the Sweet Localizer. As we know, the eyeball is only about one inch in diameter; there was a question whether the foreign body was just outside or inside the eyeball, although Dr. Keith seemed to think it had gone beyond the sclera. As it hardly seemed plausible for the projectile to have had force enough in an accident of the kind described to go through the cornea and vitreous and again through the sclera, it was decided to give the boy the benefit of the doubt and make an attempt to extract the steel with the magnet. Under general anesthesia the usual incision was made in the sclera far back near the point of localization as possible and between the superior and external recti muscles, and the point of the Haab giant magnet introduced. Although the point was turned in different directions and the current repeatedly opened and closed, our efforts were in vain. This eye was not removed, as the steel probably passed out of the eyeball. However, the case will bear close watching and if symptoms of cyclitis develop, the globe will eventually have to be removed. This boy could see light with the injured eye when he left for home a week after the operation.

In connection with this case I desire to mention a similar one seen a few months ago and to show the specimen as it seems to me to be a parallel case. The accident occurred to a boy of ten years who was watching his uncle repair some machinery with a hammer, and a piece of steel struck him in the eye. The x-ray showed the foreign body plainly about one inch behind the surface of the cornea. It seemed far enough behind the cornea to assume that it had passed through the eyeball and was behind it. There was so much swelling and inflammatory reaction that no attempt at removal was made. The eye was enucleated. The specimen, as you will see, shows that the small piece of steel went through the eyeball and passed through the sclera posteriorly near the optic nerve. You will see it on the outside of the sclera, where it seems firmly held by inflammatory exudation.

DISCUSSION.

S. G. Dabney: I think the X-ray will nearly always demonstrated whether or not a foreign

body is in the orbit. I recall one case where there was quite a large foreign body in the orbit; an incision was made through all the tissues and the body withdrawn.

An interesting feature is that this was the only good eye the man had. I have seen several cases of that kind. I reported before this Society some time ago the case of a man aged thirty who had one eye destroyed by the kick of a horse when a child. He was brought to me with a piece of steel in his only eye. The foreign body was removed by magnet thirty hours after the injury and fortunately the man afterward had vision of 20-20. Another case was a man who had lost one eye early in life and received a blow on the other eye, producing a traumatic cataract. No foreign body penetrated the eyeball, the cataract was produced by contusion, just as I believe happened in the case reported by Dr. Pfingst. After needling the cataract vision of 20-40 was secured.

Adolph O. Pfingst (closing): I am sorry the x-ray plates I have exhibited fail to show the foreign bodies plainly in the light of this room, especially the large body in the first case. This foreign body was really found by accident while we were searching for something in the eye. We did not make any special effort to determine whether it was inside or outside the orbit, because it seemed certain that it was not in the eyeball. My first impression when I saw the scleral scar and the opaque lens was that some foreign body had penetrated the eyeball and wounded the lens and thus produced traumatic cataract, and I was quite disappointed when the x-ray examination was negative. I agree with Dr. Dabney that a severe blow might cause traumatic cataract without perforation, and it is possible that the large piece seen in this case might have struck the eye hard enough to cause a cataract and then glanced from the cornea to lodge in the orbit where the x-ray reveals it.

Serotherapy of Chancroid.—In Reenstierna's case the infection with *ulcus molle* was of thirteen months' standing, and has proved refractory to vigorous and prolonged treatment of all kinds. He then inoculated the arm with pus from the venereal sore, and two typical pustules developed from which the streptobacillus was cultivated. An antiserum was prepared from the streptobacillus and by the second day after the serotherapy was begun, a marked change for the better was evident. The infection was manifestly conquered, after which the extensive sore in the groin rapidly healed.

Fat Starvation as Cause of Rickets.—Hutchinson's observations lead him to the belief that in rickets there is no fat starvation, and that the excessive loss of calcium in this condition is not brought about through the agency of fat. This conclusion is supported by the fact that the average daily excretion of soaps in rickets was 2.2 gm., as compared with 2.5 gm. in health. Fat could only remove calcium as an insoluble soap, and as there is no increase in soaps in rickets, there is evidently no connection between the calcium loss in rickets and the fat excretion.

CAESAREAN SECTION.*

By CORNELIUS SKINNER, Louisville.

The unusual experience of the author during the past year of having had four cases of Caesarean section, each for a different condition and with 100 per cent success, both to mother and child and therefore, with no regrets; has prompted the presentation of this subject for your discussion tonight.

The historical consideration of any subject has its fascination for most of us, and it has been with no little interest that I have gone a few hundred years back into this subject.

I believe that it is a commonly accepted fact that Caesarean section received its name through the statement that "Julius Caesar, from his mother's womb was ripped," but tradition is not history, and since other celebrated men as well as a few mythological gods have been accused of making their first appearance in this manner, the iconoclast has thrown his flourescopic light through this bit of tradition and it is now well known that "Julius" had nothing to do with little bit of surgical nomenclature since he made his first appearance on the 12th of July, 100 B. C., and Caesarean section was the subject of common conversation at least 1,000 years before Julius Caesar was expected to arrive. I dare say that, if in this day, we were called on to select a name for a "new operation," there would be no dearth of names from the long list of medical schools and hospitals that ornament our modern times—but those classical fellows of the long ago went right at the root of words and things and gave us "caeso matris utero."

Further proof is that, Numa Pompilius, the second legendary king of Rome, about 750 years B. C. in his "Lex Regis," issues an edict that made it obligatory upon the part of the attending physician to remove the child by abdominal section in case the mother dies during pregnancy and the child had reached the age of viability. While this was among the eccuminal laws, it was supposed to have a more ecclesiastical meaning and was intended to secure the child for baptism.

It is interesting to note that while this operation as performed on the dead or dying woman has an ancient origin, the first supposedly authentic record of its having been done on the living subject was in the year 1500 A. D. by a swine gelder or butcher, Jacob Nuffer, upon his wife, both mother and child surviving.

Scultetus writes in 1666 as follows, "We have a picture of a woman at the end of her

*Read before the Louisville Medico-Chirurgical Society.

first pregnancy, some days in labor without relief from nature's efforts, or from the assistance of thirteen midwives and several lithotomists. The husband despairing of help from these means, suggests another to his wife, and she consents. Next he procures a license from the civil authorities, and first returning home, addresses the midwives, exhorting them to be brave, but advising the timid to retire and as a consequence eleven withdrew, only two of them remaining to assist him; the lithotomists also remained.

He places his wife upon the table, implores divine help, and then incises the abdomen. Almost immediately after the incision had been made a living child was extracted uninjured, the woman making a rapid recovery.

During the three hundred years following Nuffer other attempts were made, but with little success the death rate to mothers being so very high the operation was professionally condemned.

But the long cry for relief from those revolting operations of craniotomy and embryotomy which not only sacrificed the child, but in many cases the mother as well, would not down, and brought to light the Porro operation in 1876 to be refined by Sanger in 1882 into what is almost the operative procedure of today.

Sanger's successes were attributed to three essentials, viz; a strict antiseptic technique, complete closure of the uterine wound by multiple sutures, and the deliberate selection of the time best suited for its performance.

The strict reliance upon these three simple rules by all who have followed, has given Caesarean section in the past forty years its place in spite of all objectors, but not until a set of classified reasons or indications had been adopted that could be applied in every case.

This seems to have been necessary that the profession would and should be protected from the law which in some states even today will not sanction this operation and is evidenced in a recent New York case in which the operator was sentenced for a term of from three to ten years; the learned Judge saying, "the law is the law, regardless of physicians' ethics, regardless of life or death, and regardless of private judgment."

The law says that certain surgical operations are against the rights of society and, therefore, are criminal. Nothing by way of mitigation can enter into a case where such an operation has been performed, even though the operation was a battle to save a woman's life, says the law, "the surgeon who performs it is a malefactor against society." He de-

nied the plea of the 400 doctors who stood behind the operator calling it, "an example to vultures who prey upon the public." The woman in this case died of shock. It is not known what would have been the course of the law if she had lived; neither do I know what the statutes of Kentucky have to say on the subject, but would advise that concert of opinion be secured prior to operation, whatever the indications may be.

The indications are "absolute," when it was found impossible to extract the foetus either living, dead or mutilated through the natural passage as in contracted pelvis or blocked by tumors or growths in the soft parts. "Relative" or those cases of a less degree, but yet sufficient to make the delivery of a living child doubtful. The alternative operations being forceps, version, symphysiotomy and mutilation.

Caesarean section of today in competent hands from a statistical point of view, has been a revelation. The absolute indications calling for its performance, remain unchanged, while the relative, like the by-product question in industrial chemistry, has broadened to an almost unlimited number.

Few indeed are the objectors in any case involving the slightest doubt in the safe delivery of a living and un mutilated child, or the life of the parturient, but what of those unfortunate women who are at present filling our hospital beds, having been operated upon for damage to some part of, if not the entire canal from the vaginal vault to the perineum inclusive?

No reflection is meant, nor can just criticism be made of our army of obstetricians, for I think that he who responds to this line of work is truly deserving of professional sympathy and all the emoluments that come his way.

On the other hand, when we contemplate the fact that this army consists so largely of the beginners in our noble Esculapian profession, the dear female-public should arouse our most profound sympathies, and I dare say would if there was established a just compensation which would attract and hold good men who could afford to give the time in waiting which some fat, forty-year-old parturient canal seems to require for the safe passage of a ten pound "hopeful" to full citizenship without leaving in his wake sufficient damage to keep a gynecological specialist busy for three hours to the financial tune of two hundred or more if you please? In other words, \$15.00 to make the trouble and \$200.00 for repairs is about the present status of the case, and not in the least overdrawn.

Now back to base, and in the light of the above, what is the really safe and sane procedure, not only as to life of mother and child, but for the preservation of structures, the destruction of which in many cases is beyond restoration?

There is a no more pathetic picture than a woman trying to maintain her side of a domestic or economic existence and at the same time carrying the handicap of a cervical laceration or perineal tear with its chain of accompanying hemorrhoids, useless sphincter, recto-vesicocele, or a uterus that is constantly seeking the light in the outside atmosphere.

And therefore, solely in the interest of the mothers and their physical conservation, I would add to that list of relative indication the following, viz.:

First, those cases of uterine inertia of a degree that portends the use of any means that will probably damage any part of the canal, more especially the perineum.

Second, in primipara who have attained the age not conducive to ready and sufficient yielding of the soft parts, in whom impregnation has been long delayed and the surviving of this foetus is of tremendous import, the probability of other pregnancies being slight.

Third, in all cases of placenta praevia, that complication in obstetrics, the management of which has been and still is a much mooted question, and if it were not so rare would produce more fatalities than all other complications combined.

Consult any text book either modern or obsolete and you will be struck with the great diversity of opinion among the experts as to the safest management of these cases and also the fact that there has been little progress for the better in the past 150 years. The losses are shockingly high and any operator who is fortunate enough to bring a mother and child safely through is to be congratulated indeed.

A brief report of the following cases will, I think, illustrate very well the three indications mentioned above.

Case No. 1: Mrs. Z, aged 41, American, married about one year, rather a large woman, well formed and healthy, holding a most responsible position as business manager and financial agent of a large mountain school.

Primipara, gestation normal in every particular, began her labor in the early morning of March 18, 1919. First of dilatation completed in about six hours. Expulsive pains regular and fairly forceful, but with little progress during the next eight

hours and the patient becoming rather anxious as to the outcome; realizing the necessity of terminating her delivery without further delay, and to assure her of a living child with the least damage to herself, I presented to her the two alternatives, high forceps, with its dangers to the child as well as to herself, and Caesarean section with its greater safety to both. She very promptly chose the latter, which was done eighteen hours after the labor onset.

Recovery was uneventful, both leaving the hospital three weeks after delivery for her home in eastern Kentucky, the last three miles of the journey on the back of a mule. I do not believe this would have been possible after a high forceps operation.

Case 2. Mrs. K., aged 35, apparently healthy but rather fat, married ten years, primipara, began labor October 14, 1919.

Dilation was completed in a few hours, to be followed by ten hours of very slight and ineffectual expulsive pains, oncoming head still at the brim, patient becoming very nervous and showing considerable exhaustion. High forceps versus Caesarean section were presented as in the first case, and the latter was accepted. Operation was uneventful, except that there was disclosed several mural fibroids and one sub-serous tumor about the size of an orange; the latter being removed, smooth recovery. Let me say that patient had never shown any symptoms of this fibroid condition prior to her delivery; and is it not more than probable that the inertia in this apparently healthy, strong woman was due to the fibroid degeneration and which would of course not have been recognized if forceps had been used? And may it not have been an operating factor to promote postpartum hemorrhage? It seems to me more than probable.

Case No. 3. Mrs. F., aged 41, strong, healthy but fat, married ten years, primipara, gestation normal, began labor November 14th, 1919, full dilatation completed in a few hours, expulsive pains regular but feeble and inefficient, making no progress whatever in eight hours, patient showing tire and some anxiety. Section was readily accepted by both patient and husband but sterilization declined. This was a parallel case to No. 1, with the exception that she has been able to nurse her baby through normal lactation.

Case No. 4. Mrs. S., aged 35, four-para, the three former gestations and deliveries normal, children living and healthy, patient healthy and gestation uneventful until about the end of the seventh month when she had, without apparent cause, a rather severe hemorrhage which was controlled by rest in bed for a day

or two. Patient and husband were informed of the true condition and its danger. She was ordered to give immediate notice if the hemorrhage should recur. Three weeks later, or about ten days before her expectancy, she had a second hemorrhage, not so severe as the first, and was sent at once to the hospital for closer observation.

Having had in the past some rather trying experiences in dealing with placenta previa, I felt no hesitancy in urging section at once. Both parties consented and the operation was done one week before her labor was due.

Looking back over these cases, I feel that section was by far the safest procedure.

DISCUSSION.

Sidney J. Meyers: While it is undoubted that during recent years many unnecessary caesarean sections have been performed, there are times when delivery by this method is advisable. Eclampsia with its attendant dangers is sometimes better managed by Caesarean section than in any other way; in contracted pelvis and in certain cases of placenta previa Caesarean section is absolutely necessary and is attended by slight mortality to both mother and child.

As Dr. Skinner has said, in difficult labor there may be considerable injury inflicted upon the canal; but unfortunately no one can foretell whether or not damage will occur in any case. Every obstetrician of experience has seen perfectly normal labor progress nearly to completion without damage to the soft parts, and then for some unforeseen cause or something beyond his control an extensive laceration would ensue.

I do not believe the time will ever come when Caesarean section will be popular as a method of delivery unless definitely indicated by contracted pelvis, disproportionate size of child and canal, placenta previa, or eclampsia. The practice of obstetrics differs little from other branches of medicine, and many of us are faddists.

I do not believe the obstetrician ought to be the surgeon; surgery is one thing and obstetrics another. There are two disadvantages in such a plan; (1) The obstetrician who does his own Caesarean sections might be tempted to perform a great many more than are really necessary; (2) the obstetrician who does his own Caesarean sections lacks the advice and counsel of some surgeon whom he might call. When the indications for Caesarean section become urgent, there is need for both the surgeon and the obstetrician. And just here I wish to state that not every surgeon who is called by the obstetrician to perform Caesarean section will agree that the operation is indicated. I have often called surgeons in consultation

who would advise that if possible the patient be delivered through the normal channel.

If Caesarean section were without danger, if we could promise one hundred per cent favorable results for both mother and child, probably some day this would be the selective method of delivery. I know of several women who are living today after Caesarean section who are very much delighted because it saved them a great deal of time, their convalescence being more rapid and with less inconvenience than following normal labor.

J. Garland Sherrill: The indications for Caesarean section seem well understood and clear-cut, and I do not believe there is any great diversity of opinion on the subject. One of the strongest exponents of this operation in placenta previa centralis is Zinke, of Cincinnati, who is an extremist on the subject, yet he opposes Caesarean section in the treatment of eclampsia, claiming he can relieve the majority of the patients by the administration of enormous doses of veratrum viride.

I believe it is the consensus of opinion among members of the profession that Caesarean section offers the best chance of recovery in many cases of eclampsia and also in the toxemia of pregnancy when the patient is approaching term. I have performed the operation based on these indications, as well as in contracted pelvis and the presence of tumors complicating pregnancy, and have found it quite satisfactory.

A skilled obstetrician may be able to safely deliver a woman with placenta previa marginalis, and it is well to secure the opinion of such an obstetrician before resorting to surgery. In placenta previa centralis the risk to both mother and child is enormous, particularly if there is a narrow outlet which will delay dilation and delivery. Even should one be fortunate enough to save the mother the child will likely perish because of trauma incident to rapid delivery.

One of the strongest arguments in favor of the Caesarean operation versus forceps delivery is that the child is not subjected to the danger of injury by compression of the head; but notwithstanding this and the fact that the mortality of Caesarean section has been reduced to the minimum for both mother and child, I do not believe any surgeon or obstetrician of prominence would recommend the Caesarean operation unless it was specifically indicated. While I have seen a few patients successfully delivered by high forceps operation, where the child seemed proportionately larger than the outlet, I am positive Caesarean section is the safer procedure under such circumstances. If it can be determined by roentgen-ray examination or other means that the child's head is larger than the pelvic outlet that would certainly be an indication for the Caesarean operation. I must con-

fess, however, that in some instances where the outlet may appear small the ability of the tissues to distend and dilate will allow the delivery of a child that seemed absolutely impossible.

The most of us were taught that a child with the vertex presenting in the posterior position could not possibly be delivered without rotation. However, have known of such cases where delivery was accomplished without trouble and without any damage to the soft tissues; but with great pressure from the advancing head there is danger of sloughing of the vaginal tissues with infection thereafter and delivery by the natural route becomes a serious matter. In such cases the advisability of the Caesarean operation must be considered.

Personally I would rather perform the Caesarean operation than to dilate the os and deliver rapidly by accouchement force. In a primipara suffering from the toxemia of pregnancy the Caesarean operation is probably a safer procedure than accouchement force, but it would be inadvisable for either the surgeon or obstetrician to assume the responsibility of such a serious operation without consultation.

Craniotomy is unjustifiable under any circumstances whether the child be living or dead provided a competent operator can be secured to perform Caesarean section. Craniotomy is a dangerous operation because the soft parts of the mother are often subjected to considerable damage.

Ben Carlos Frazier: I am familiar with the views of Zinke who thinks Caesarean section unnecessary in eclampsia. I have had several cases of eclampsia where both babies and mothers were saved by this method of treatment. Not long ago Dr. Sherrill performed Caesarean section on a patient of mine with eclampsia, and both mother and child were saved. I expect to make a complete report of the case later.

L. Wallace Frank: I think placenta previa centralis and also eclampsia without convulsions are certainly absolute indications for Caesarean section should be performed. In placenta previa where rapid, forcible delivery is necessary, the dangers to life of both mother and child are exceedingly great, not only from hemorrhage, but also from shock.

In eclampsia without convulsions I believe Caesarean section should be performed. In some cases, however, conservative treatment may be indicated with delivery by forceps. Where blood examination, especially the blood chemistry, and the eye grounds indicate that one is safe in giving the woman a chance to deliver herself, that plan should always be followed. If the blood chemistry shows a high percentage of urea and the eye grounds show choked disc, especially if the patient is an elderly primipara,

I believe Caesarean section is the method of choice.

Of course there are other definite indications for the Caesarean operation. It contracted pelves there is practically no other safe method of accomplishing delivery. The Caesarean operation offers the woman a chance for a living baby, whereas the high forceps operation might not.

Owsley Grant: It may be interesting to state that during the late war, while in Berlin I saw some of the most marvelous obstetrical work. We visited the clinic nearly every day and had the opportunity of seeing a great many obstetrical operations. The most remarkable thing was four decapitations in a single day!

I have been particularly interested in the discussion of eclampsia. I did not know that Caesarean section was ordinarily performed in the treatment of eclampsia. It seems to me the most important feature would be the advisability of administering an anesthetic and emptying the uterus before the patient had reached the stage where Caesarean section became necessary.

I would like to ask whether any work of this kind has been done under spinal or sacral anesthesia. It seems to me this method of anesthesia would be particularly applicable to cases of this type.

Louis Frank: There are certain features in connection with a Caesarean section which have not been sufficiently emphasized, and it is necessary that we thoroughly "understand ourselves" before we undertake to discuss the subject.

If we approach the question from the standpoint of the trained and skilled obstetrician, there are only a few indications for the Caesarean operation, but these must be carefully borne in mind. Certainly from this standpoint the age of the patient should hardly be considered, as even a relative indication for Caesarean section. There are many indications which are granted theoretically as relative indications for Caesarean section, and these in the hands of those unskilled in obstetrics might easily be looked upon as absolute indications. So we must understand and appreciate the viewpoint of the observer before we can intelligently discuss the subject. For example, to a man who does nothing but surgery, one who "is after a reputation," one who desires to perform a large number of operations, there would be a good many absolute indications for Caesarean section. Unfortunately this is also true of other surgical procedures.

My personal conviction is that this is not a question which can be discussed from a purely surgical nor from a purely obstetrical standpoint. If we discuss it from a surgical stand-

point and leave obstetrics out of the question, we are going to get into deep water! Today in a well-equipped hospital, with a competent corps of nurses, the operative mortality is very low from Caesarean section, and probably also from many other types of operations, even in the hands of the untrained; and I think that of itself has caused a great deal of trouble; it has increased the number of operators and one must differentiate between operators and surgeons just as between accoucheuse and obstetricians. In uncomplicated cases and at a selected time, i.e., at what may be termed the time of election, there is practically nothing more simple and easy than Caesarean section; but in what I consider one of the absolute indications for the Caesarean operation, that is central implantation of the placenta, it is not always so easy; and when we talk about the great reduction in mortality in such cases we are not stating facts, because there may be considerable maternal mortality in placenta previa centralis as a result of hemorrhage. I have performed a moderate number of Caesarean sections, and have had such an experience within the last eighteen months, and in the hands of men who have done five or six times as many Caesarean sections under similar circumstances the mortality must have been greater; so in speaking of relative indications and positive indications, we cannot always hold out brilliant prospects to the patient and her family by stating that the operation is a simple affair without danger. I have had fatalities in two or three cases of puerperal eclampsia where probably my judgment was at fault in delaying the operation too long. I recall one patient seen with Dr. Simpson, a primipara, who developed convulsions and died in spite of the operation. Another case of eclampsia was seen with Dr. Tuley. So even Caesarean section, with absolute indications before you, is not always successful.

Where there is disproportion in size between the child and the pelvic outlet, or something which prevents delivery or requires interference to such an extent that irreparable damage is likely to the child or mother, many difficulties may be presented. Unfortunately these are oftentimes not operations of election; in this part of the country at least they are as a rule operations of necessity, performed after the woman has been in labor for two or three days; and in such cases the mortality is high.

All these features must be considered, and if we are going to suggest Caesarean section as an operation of choice, one which is to become popular and will be sought by pregnant women, both sides of the question must be fairly presented; the operation should not be looked upon always as one without mortality and in which

the results are as brilliant as in the cases reported by the essayist.

Personally I do not believe marginal implantation of the placenta is an indication for Caesarean section, because a good obstetrician can usually accomplish delivery in the normal way; nor do I believe uterine inertia, no matter what may be the age of the woman, is an indication for Caesarean section; in fact, it might be dangerous because of failure of the uterus to contract; that is one of the dangers incident to Caesarean section. I think, as somebody has already stated, that entirely too many Caesarean sections are being done.

Very early in my surgical career I had the fortune to see several cases where fibroid tumors obstructed the pelvic outlet. Dr. Simpson will recall one patient whom we had under observation for two or three months. The woman had suffered from specific infection. She had a large vaginal scar which resulted from too energetic treatment, the vagina would barely admit the examining finger and the cervix could not be felt, yet she became pregnant. She was finally sent to the Saint Mary & Elizabeth hospital and kept under observation for two months contemplating Caesarean section, yet she was delivered at term without the least difficulty. Another patient with fibroid tumor completely obstructing the pelvis was kept in the Norton infirmary for several weeks. Two or three other gentlemen saw her and Caesarean section was advised, but we concluded to wait until the beginning of labor. The patient became dissatisfied and finally went home, and her physician was prepared to deliver her, if necessary, with a pocket knife; yet she "delivered herself" at term before the doctor appeared on the scene of action. I reported to this society fifteen years ago twelve cases of fibroid tumors complicating labor with definitely obstructed pelvis, yet in not one of them was Caesarean section performed. In every case of fibroid tumor complicating pregnancy that has come under my observation, the fibroid has seemed to move out of the way and the woman has been delivered through the natural channel. I have seen ovarian cysts obstruct labor, but have never seen a fibroid tumor do so.

In my opinion there are few absolute indications for Caesarean section, and these are fairly well understood. I believe obstetrics is surgical practice and the obstetrician should have competent surgical training, he should be capable of doing his own work. Whether he does so or not is a matter of choice with him, but he should be prepared. As an illustration, suppose Dr. Meyers were called to an adjacent city at night to see a woman in labor, who had eclampsia, placenta previa centralis, or obstructed pelvis? Why should it be necessary for him

to send to Louisville for a surgeon to perform Caesarean section? The obstetrician should be prepared to do this work when necessary. I do not believe it would tend to make faddists of obstetricians, as has been suggested; on the contrary it would lead to much better results.

It would be a serious mistake to advocate Caesarean section simply to prevent damage to the parturient canal. The vast majority of women have the soft parts more or less damaged during labor, but the damage can be later repaired by a minor operation at less risk and less danger than would attend Caesarean section.

The point mentioned by Dr. L. W. Frank seems important. As an illustration, a physician from an adjoining city brought a patient to Louisville a few days ago on account of tremendous general edema. She has a very high blood urea; she has had no convulsions; she is in the eighth month of pregnancy; what her eye grounds show I do not know; but she is evidently in the pre-eclamptic stage of puerperal eclampsia; her blood pressure is high. If we were to perform Caesarean section on that woman at once I believe it would be a serious mistake. She is approaching term and the best thing is to keep her under observation in the hospital and be prepared to do a Caesarean section immediately if the operation is demanded. At the same time some of us are prone to err in the opposite direction, that is delay Caesarean section too long in cases of this type. It is largely a question of judgment.

If Caesarean sections should become an every day occurrence, like appendectomy and ovariectomy were several years ago, I am fearful a great many women would be subjected to this operation unnecessarily. In women who are to become pregnant again there is some risk from rupture of the uterus after Caesarean section. However, I believe it is absolutely unjustifiable, except in comparatively few cases, to ever sterilize these women.

Frank C. Simpson: I agree that there are but few absolute indications for Caesarean section. I do not believe in recommending this operation in cases of uterine inertia, because in the majority of instances the uterus can be stimulated. The most important point is the decision when to operate.

In cases of uremia, toxemia, etc., without convulsions, when treatment by elimination and regulation of diet has been faithfully tried for a week or ten days without improvement, it is necessary to empty the uterus by Caesarean section or in some other way. The Caesarean method is usually safe and has been done in many cases with preservation of both mother and child. Two positive indications for Caesarean section occur to me based on my work in ob-

stetrics, i.e., placenta previa centralis, and severe uremia or toxemia.

In forty years of practice I have lost only one patient from the toxemia of pregnancy, and that was a young woman Dr. Frank operated upon a few months ago. I have seen quite a few patients with convulsions, but have been able to relieve them by rapid delivery, and have never lost a mother or child until recently. I have never lost a patient from placenta previa. I remember one case where there was a central implantation of the placenta in a woman seen during the eighth month of pregnancy. When I arrived the woman was bleeding profusely, chloroform was administered immediately, I simply forced my hand through the placenta and grasped the child's foot; delivery was then rapidly completed and fortunately the life of both mother and child saved.

I have seen several cases of marginal implantation and have been able to carry the patients through and deliver them at term.

I have always argued against Caesarean section except in cases where it was definitely indicated, such as contracted pelvis, the presence of tumors obstructing the canal, and sometimes in uremia or toxemia before convulsions developed when the woman was near term and there was a possibility of saving the life of the child.

I believe many Caesarean sections have been performed where the patients could have been safely delivered in the normal way. It is often-times a matter of judgment as to when the operation shall be performed.

Owsley Grant: In connection with the case reported by Dr. Frazier, the following may be of interest. I was asked by him to see a man aged fifty years, a cooper by occupation, who had been working that day and feeling apparently well. According to the history there had been no gastrointestinal disturbance. After returning from his work in the evening he had a violent convulsion and became unconscious.

When I saw him, he had complete opisthotonos, positive Kernig, blood pressure 115-80. The urine was examined subsequently and found normal except a faint trace of albumin, no casts; creatinin 23 milligrams, spinal puncture revealed no increase in cell count; blood and spinal fluid Wassermann negative.

The patient complained of severe pain in his right side, but deep palpation disclosed no further information. The character of the pain, which radiated downward along the thigh, was suggestive of renal colic. He was sent to the hospital for roentgen-ray examination, and the roentgenologist thought he discovered a large calculus in the right kidney pelvis. Not being entirely satisfied, I insisted that another examination be made. The patient was given in the

interim several compound cathartic pills. The second examination was negative. An enormous fecal movement occurred following which all the symptoms subsided. He had no further convulsions and was dismissed from the hospital well within a few days.

The interesting feature about the case is that the symptoms developed suddenly without antecedent history. Apparently the manifestations were due to intoxication from accumulated feces.

John J. Moren: As the symptoms developed suddenly, doubtless there occurred a slight hemorrhage in the so-called silent area of the brain which was taken care of by collateral circulation.

W. E. Gardner: The case looks to me like one of temporary aphasia, and as suggested, may possibly be due to thrombosis or embolism. In some cases of this kind there is probably a spasmodic occlusion of the blood vessel, an intermittent claudication more or less transitory in character, which accounts for the symptoms presented. This is especially true where there is no subsequent paralysis. If there is paralysis following the syndrome, then we would conclude there was a thrombotic condition on account of the gradual development of the paralysis.

H. H. Grant: My idea is that the condition described by Dr. Frazier may be attributed to one of three things: (a) toxemia (b) cerebral thrombosis, or (c) hysteria. I believe, however, the symptoms were due to toxemia. I have seen many elderly people who, after over-eating or other imprudence, developed dizziness, loss of memory, etc. It is also known that people in good health have developed symptoms, temporary in character, similar to those described by Dr. Frazier, simply from gastro-intestinal disturbances. And while it is possible there may have been an embolus in this case, my belief is that the symptoms were due to toxemia.

Carminative Action of Volatile Oils.—Gunn is of the opinion that the carminative action of volatile oils can best be explained by their relaxing and inhibiting the movements of plain muscle. Their other effects on the gastro-intestinal tract may be explained by their local irritant action, by reflexes arising therefrom or possibly by acceleration of absorption.

Effect of Emetin on Endameba Dysenteriae.—Using emetin for Endameba dysenteriae from various sources, Allan says in no instance did emetin affect the appearance or motility of these organisms in the stools in dilutions weaker than 1:2,000 in from one to two hours, and often dilutions as strong as 1:150 failed to kill the endameba in the allotted time.

VISCERAL REFLEXES.*

By CUTBERT THOMPSON, Louisville.

The simplest conception of a reflex presupposes an afferent nerve with an end organ, or receptor, which receives and conducts a stimulus to the central nervous system. From this section of the brain or cord another stimulus passes out along an efferent nerve to its end organ. It is questionable if any such simple reaction as this ever takes place, usually it is much more complex, as all parts of the nervous system are so connected together that no part of it is capable of reaction without more or less affecting other parts; hence instead of this simple reaction after the stimuli are received by the central nervous system other nerve cells are excited and many different efferent nerves may be affected. This conception of a reflex, therefore, embraces at least three separate structures, a receptor which receives the stimulus, a conducting nervous path connecting this receptor with an organ in which the reaction takes place, as skin, muscle or gland. These form a reflex-arc. The type of stimulus to which any afferent nerve responds is determined by its end organ or receptor, and these receptors are so specialized in function that they respond to one and only one kind of stimuli; this is defined by Sherrington as "Selective Excitability." Well-known examples of this are the nerves of special sensation, and the nerves of common sensation, some are excited by thermal changes, others by mechanical stimuli, causing pain and of these nerves of common sensation, some convey epicritic and others protopathic sensation.

The type and intensity of the stimulus which excites any receptor is called the adequate stimulus for that special receptor.

CLASSIFICATION OF REFLEXES

The reflexes of the body are concerned with every vital function, and every reflex has a purpose. They have been classified as to their place of origin, as skin, superficial, deep, tendon, muscular and organic, or they may be classified as to their function, reproduction, nutrition, protection or as to the type of stimuli which produce them, mechanical, chemical, thermic, etc. We will only discuss tonight a very limited subdivision, namely these reflexes which originate in the viscera and the effect of which is observed in the walls of the body.

VISCERAL REFLEXES

From the viscera in normal conditions stimuli constantly pass to the cord, yielding re-

*Read before the Louisville Medico-Chirurgical Society.

flexes on blood pressure, etc., but these being below the threshold of consciousness do not obtrude themselves on the conscious mind. If, however, a morbid process in a viscus gives rise to an increased stimulus, not only are the cells directly connected with this afferent nerve involved, but in addition other nerve cells in the same or in different parts of the central nervous system may be excited, hence we may have pain due to the irritation of the sensory nerve cells, giving us the viscerosensory reflex, we may get contraction of the skeletal muscles due to the irritation of the motor cells, the visceromotor reflex, or, if the nerve cells which govern secretion, organs, etc., become excited, we get what Mackenzie calls organic reflexes.

In other words, we see that a stimulus passing from any viscus to the central nervous system may, if of sufficient strength, stimulate not only the cells directly connected, but also other nerve cells in the same section, and these responding according to nature of their functions, giving sensory, motor, or trophic reflexes.

We will take the component parts of the reflexes up in the reverse order to that in which they are produced, namely in the clinical order preceeding from the effect to the cause.

VISCERO-SENSORY REFLEXES

When the sensory cells in the ganglion on the posterior root of the spinal nerve are excited, no matter from what cause, pain is felt as if the irritation occurred in the end organs of the sensory nerve which originates from these sensory cells, (for the brain is only accustomed to receive such stimuli from these terminals), hence when strong stimuli pass along the afferent sympathetic nerves of the viscera and excite these sensory cells in the ganglia on the posterior roots the brain on receiving these stimuli concludes that the stimulus came from the usual receptors of these sensory cells.

This irritation of the sensory cells of the posterior root caused by visceral disease may produce hyperalgesia in three groups of peripheral tissues, namely the skin, muscles, and the loose layer of connective tissue just outside the peritoneum.

Cutaneous hyperalgesia may be either superficial or deep. The superficial is the least common and is best elicited by lightly touching the skin, its extent is more limited than that of the deep, and is included in the same area. It never occurs except in cases where the deep is present.

The deep skin hyperalgesia can best be determined by lightly pinching the skin. It is in this region of the skin that pain is so

often felt as the result of visceral irritation, the reason for this is that we have here so many end organs of the sensory nerves.

Hyperalgesia of the skin is not caused by irritation of the same nerves which cause hyperalgesia of the muscles as the sensory nerves to the muscles follows the same course as the motor nerves, hence the areas of irritation may not be co-extensive.

Muscular hyperalgesia is even more common than hyperalgesia of the skin, but can only be recognized with certainty, when the sensibility of the skin is not affected. Sometimes only a part of a muscle may be hyperalgesic, and of this one special part may be more affected than the rest (as in McBurney's point) the point where the motor and sensory nerve enters the muscle. Not only are these muscles hyperalgesic, but the stimulus going to the cord may cause an irritation of the cells in the anterior cornu of the cord giving us the visceromotor reflex.

VISCERO MOTOR REFLEXES

By this is meant a contraction of the voluntary muscles of the external body wall in response to a stimulus from a viscus, in contradistinction to a normal superficial reflex where a muscle gives a brief contraction, in response to a stimulus from the skin.

Sherrington has shown that when the central end of a divided sympathetic nerve passing from the viscera to the cord is stimulated, there is produced a contraction of definite muscles in the abdominal wall.

He has also shown a difference in the reaction to nerve stimulation, between the flat muscles of the abdomen and the muscles of the limbs.

The figures that constitute the nerve supply of any given muscle leave the cord in separate bundles. If one of these bundles is stimulated the whole length of a muscle in a limb contracts, whereas if one of the bundles that supply an abdominal muscle is stimulated, only a portion of the fibres of the muscle contract.

Another point to be remembered is that often a small portion of an abdominal muscle, in response to a visceral stimulus may remain in a state of contraction for a considerable period, just as long as the visceral lesion keeps up an adequate stimulus.

This limited contraction of a muscle has often been mistaken by a palpating hand for a tumor, or a thickened appendix.

Before the contraction of these abdominal muscles due to this visceral irritation is well marked, strong and firm contractions may be readily provoked by palpation, especially if there is a viscerosensory reflex in these muscles, or in the skin over them. This board-like contraction of the abdominal muscles may

be caused by peritonitis, but can occur in cases of visceral irritation in which there is no peritonitis as in cases of stone in the ureter and in gastric ulcer.

ORGANIC REFLEXES

The organic reflexes are often very complex as a number of subsidiary centres in the brain and cord may become excited and vomiting, secretory, cardiac and vaso motor reflexes may be produced. These I will refer to later when I consider the reflexes produced by the different visceral organs.

CENTRAL NERVOUS CONNECTIONS

There is always in these reflexes a definite central nervous connection between the irritated viscus and the part of the external body wall, where the pain is felt, the muscles contracted, or the organ or gland stimulated.

According to the intensity of the visceral stimulus, actual pain may be experienced in the body wall or there may result only a state of hyperesthesia or hyperalgesia which manifests itself by an increased susceptibility to other stimuli, so that stimuli which in ordinary conditions would evoke only sensations of touch may give rise to actual pain.

Once this irritation of the central nervous system has been set up, the results may remain long after the original cause of the irritation has come to an end, and during this period mild stimuli may in this region excite excessive reflexes. This explanation may account for some of the so-called "painful spots of hysteria, and the easily exhausted nerves of the neurasthenia."

AFFERENT IMPULSES

Formerly one of the most debated questions in relation to the visceral reflexes was; what are the structures by which the afferent impulses are carried to the central nervous system? I believe all authorities now agree that these impulses reach the central nervous system through the two divisions of the sympathetic. A question which is still unsettled is, what constitutes an adequate stimulus, so that a viscerosensory reflex may be produced, and further does the brain refer the sensation of pain to the viscus irritated, or in other words, is there such a condition as a painful stomach or painful liver?

On these subjects I will quote the statements of some of the leading writers.

Mackenzie has proved to his own, and to the satisfaction of many others, that the stimulus which passes along these sympathetic nerves from the viscera, and excites these reflexes are not painful stimuli, like those transmitted by the cerebro-spinal sensory nerves. He believes that the stimuli are usually pro-

duced by the contraction of unstripped muscular fibres.

He cites examples of the intense agony produced by the contraction of hollow muscular organs, as in the gall stone colic, etc., and states that only organs containing the unstripped muscle can originate these stimuli.

He quotes a case in which an operation on an umbilical fistula was done without general or local anesthesia. After entering the abdomen adhesions were cut and broken up, stitches were used in the bowel, and mesentery and only when a peristaltic wave passed along the bowel was pain felt, and then it was not felt in the bowel, but in the middle line of the abdominal wall at the level of the umbilicus, twelve inches away from the contracting bowel.

One condition may be a possible exception, and that is peritonitis, acute, or chronic, which may produce cutaneous hyperalgesia and muscular contractions.

This, he thinks, may be accounted for by the adhesions of the viscera to the parietal peritoneum, and that the dragging of these, irritates the loose layer of connective tissue lying outside the peritoneum, which is richly supplied by sensory nerves of the cerebro spinal system.

Distension of an organ is believed by many to be an adequate stimulus to produce the sensation of pain. In this connection Sherrington has demonstrated that a reflex (causing a rise in blood pressure can be obtained by the injection of salt solution into the bile duct. Mackenzie believes that distention only causes a reflex when a contraction of the non-stripped muscular wall is produced.

The passing of a calculus down the ureter causes intense reflex pain. This is claimed by some to be due to the distention, but particles of gravel which do not cause distension gives similar pain.

Mackenzie's theory would account for the reflex pain in both cases, and states that artificial stimuli produces pain in the external wall, but no known artificial stimulus can produce visceral-reflex pain, without calling into play the contraction of the non-stripped muscular fibres of the organ.

His conclusions on this subject are that irritation of the viscera is not felt in the organ itself but is referred to the peripheral distribution of the cerebro-spinal nerves in the external body wall. His contention is that the viscera are only supplied by the sympathetic nervous system, and that the afferent nerves of the sympathetic are not sensory.

Hilton in "Rest and Pain", referring to the viscerosensory reflex says sympathetic pains on the surface of the body connected

with derangements of the internal viscera are of great and pressing interest to us. "I conceive that pains situated upon the surface of the body, and associated with some abnormal state of an internal viscus, must be looked upon as a beneficent provision enabling us by external pain to receive the information and to appreciate slight organic changes or derangements of function of the internal viscera."

Again in regard to the location of the pain due to visceral disease he says, "I think it likely that the pain which persons experience in the disease of these viscera (stomach, liver, etc.), may be explained by the relative position of the great splanchnic nerve, communicating on the one hand, with the solar plexus, and thence with these digestive organs, and on the other distributing the branches to the fourth, fifth and sixth dorsal nerves.

In another place he says, "I venture to express my belief that some of these filaments of spinal nerves go through the sympathetic ganglia and thence, associated with the sympathetic, travel upon the artery and become ultimately distributed, I believe, to the walls of the large and small intestine.

Head's view of this subject is that where a painful stimulus is applied to a tissue or organ which possesses a low degree of sensibility, and which is closely associated centrally with another organ possessing a higher degree of sensibility the pain produced in the irritated organ is felt in the more sensitive one.

Dana agrees with Head and states that the afferent fibres of the sympathetic are very few compared with the efferent so that the viscera have no sensibility except on great and peculiar irritation.

The sensations reach the cord through the afferent sympathetic and are conducted to the brain and consciousness through the cerebro-spinal sensory fibres which in general refer the pain to the corresponding somatic segments.

He believes that the afferent sympathetic conveys protopathic sensation.

Luciani's conclusion on this subject is, "The organs and internal tissues innervated exclusively by the sympathetic nerve fibres are little sensitive to pain. Stimuli, under normal anatomical and functional conditions, but in a state of inflammation they may acquire an exquisite sensibility to pain."

Ross states that visceral pain is of two kinds, one he calls splanchnic, because it is referred by the brain to the site of the lesion in the viscus involved, the other he calls so-

matic because it is referred to definite areas in the external body wall.

Hertz' opinion is about the same, that there is a visceral pain and a referred somatic pain expressed reflexly through the spinal nerves

Crile refers to the fact that direct injury to the gall bladder, or cystic duct produced no pain or reflex, and concludes that the pain caused by the passage of gall stones or urinary calculi is the adequate response to pressure from within, and is caused by a reproduction of the normal type of stimulus which induces the evacuation of their contents.

DIAGNOSTIC VALUE

These visceral reflexes may be of great value to us in determining the cause and seat of disease. The viscerosensory reflexes are the most important in this connection. Pain is the most frequent symptom which people come to consult us for, it is usually the first warning that the patient has of disease, and the determination of its cause is one of our most difficult tasks, even when the pain is definitely localized and referred to a special area on the surface of the body. It is even more difficult in the case of pain caused by visceral disease.

Moreover, as pain is often felt long before any objective sign of disease is manifest, too often it is misinterpreted by us and called functional, and we overlook a disease while it is still in the preventable, or at least curable stage.

To be of service to us in diagnosis the different parts of the reflex arc must be known. We must find out the exact area where the reflexes were first observed. This is of special importance, as after a length of time owing to the irritation of neighboring areas in the central nervous system, other and more complex reflexes may be excited. Having found out the area where the reflexes are first observed, we must trace back through the efferent nerve supplying this region, to the part of the central nervous system from which it springs, and knowing what afferent nerves enter this part, we can often proceed back along it to the organ from which the original stimulus came.

This is not possible in every case, for although much has been found out about many of the viscera, still the functions of the afferent nerves from them are hard to discover, as they afford very little direct evidence of their functions (as in the pancreas and spleen). Another reason for not always being able to exactly locate the organ from which the afferent impulses come is, that two organs may be connected with the same section of the cord, and although we may know

the section of the cord irritated, we can't tell from which organ the afferent impulses come.

SEGMENTATION OF BODY

To understand the seeming erratic distribution of some of the spinal and sympathetic nerves we must refer to the changes in position of some of the organs of the body during development.

I quote from MacKenzie:

In primitive vertebrates before the development of the limbs, each spinal nerve is distributed round the body, and branches of the sympathetic nerves to the visceral issued from the cord with the spinal nerves at the same level, so that the nerve supply of an organ and the nerve supply to the external wall covering the organ arise from the same section of the spinal cord.

With the development of the limbs the relationship of the situation of the viscera to the allied spinal nerves becomes modified, although the relationship of the spinal and sympathetic nerves remain. To still further complicate this relationship during the stage of development the viscera are displaced backward, and the nerves instead of running around the body on a level with their exit from the cord become distributed in an apparently irregular fashion.

Thus in man the lower cervical and upper dorsal nerves are distributed mainly to the arm. This explains the fact that the skin as low as the second rib is supplied by the fourth cervical, while the next segment of skin lower down is supplied by the third dorsal nerve.

The afferent sympathetic fibres from the heart reach the cord at the level of the upper dorsal nerves, so that the pain in affections of the heart is felt along the distribution of the upper dorsal nerves over the heart, and also down the inner surface of the arm.

The same diversion of nerves takes place down the whole length of the cord, hence symptoms of visceral disease may appear in the legs.

Hence in consequence of this diversion of nerves, and displacement of the organs during development, the symptoms arising from a viscus may appear at some distance from the situation of the viscus.

CLINICAL VALUE OF THESE REFLEX SYMPTOMS

We will now consider the reflexes originating in some of the viscera but one fact must be borne in mind, namely that some of these organs not only have afferent nerves belonging to the sympathetic proper and to the para-sympathetic, but also those supplied by the phrenic (liver and diaphragm) have a connection direct with the cerebro-spinal system.

HEART

The reflexes caused by affections of the heart have been more thoroughly investigated than those of any of the other viscera. The afferent nerves of the heart belong to the sympathetic and para-sympathetic systems, the sympathetic branches connecting with the second to the fourth dorsal segments of the cord but specially with the second and third, the para-sympathetic connection is along the afferent fibres of the vagus and through it with the medulla, and with the second and third cervical segments of the cord.

The viscerosensory reflex from the sympathetic is experienced in the skin areas connected with the second and third dorsal segments of the cord that is the skin over the second and third ribs on left side and down the inside of the left arm as far as the elbow.

From the para-sympathetic, through the connection of the vagus, with the second and third cervical regions we get hyperalgesia of the skin on the left side of the neck and jaw.

The visceromotor is seen in the spasm of muscles supplied from the same regions hence we have spasm of the upper intercostals and pectorales major, and the sterno-mastoid and trapezius on the left side. The organic reflexes are shown by the excessive secretion of saliva and urine.

LUNGS AND PLEURA

Pottinger has worked out the reflexes caused by diseases of the lungs. The afferent sympathetic from the lungs and pleura are connected principally with the third and fourth cervical and the second, third and fourth dorsal segments of the cord and the reflexes, motor, sensory, and trophic are made evident along the course of the spinal nerves connected with these segments, hence the pain, spasms, and atrophy of muscles and changes in the skin in this region in diseases of the lungs.

He further states that when the disease exists in the anterior portion of the lung the reflexes are at first, and for the most part shown in the anterior part of the chest, and when the disease exists in the posterior part of the lung the reflexes first occur in the posterior chest wall.

MacKenzie states that the lung itself and the visceral pleura is insensible to stimulation when healthy (as is seen when an exploring needle penetrates the lung) or when diseased. It is well known that the lung may be acutely inflamed, torn by an apoplexy, ulcerated and scooped out by a tuberculous process and no sensation be felt by the patient.

When pain arises in connection with af-

fections of the lung, it is either due to the implication of the partial pleura or to the visceromotor or viscerosensory reflexes.

DIGESTIVE TRACT

The nerve supply of these organs is derived partly from the cerebro-spinal and partly from the sympathetic.

The cerebro-spinal supplies a small portion only, at the two extremities of this system. The sensory nerves at the oral end are those of special sensation, and a limited area, including the upper end of the esophagus has nerves of common sensation.

At the anal end the cerebro-spinal nerves extend as far as the inner side of the external sphincter.

The remainder of the alimentary canal and the glands derived from it receives a double nerve supply, from the sympathetic and the parasympathetic.

ESOPHAGUS

Irritation of the esophagus produces a reflex pain on the anterior surface of the chest, in the middle line, at the lower end of the sternum. Its nerve supply is from the vagus, and the reflexes are principally in organs which are innervated by it and also through its connection with the cord in the second and third cervical segments.

Viscerosensory reflex is experienced along the skin in the middle line anteriorly.

STOMACH

In disease of the stomach we get two groups of reflexes, one due to the afferent sympathetic going to the cord in the region of the sixth, seventh and eighth dorsal segments and the other on account of the vagus connections in the brain and upper cervical segments of the cord.

Those due to the vagus excite principally organic reflexes in other organs supplied by the vagus, and those due to the sympathetic are found in the skin of the epigastric region supplied by the sixth, seventh and eighth dorsal nerves on the left side.

The visceromotor reflex is at first located in the upper part of the left rectus supplied from this same region of the cord.

The site of the pain, and the contracted muscles, leads many to believe that the part of the stomach involved lies just beneath the part of the abdominal wall affected by these symptoms, and that a pin pushed in through the painful area in the skin and muscle would strike the ulcerated spot. If this were so the painful spot should move on deep inspiration and expiration, but it does not, moreover the result of X-ray examinations and the

operations proves that the actual site of the ulceration has no direct relation to the place the pain is felt.

Post-mortem examination proves the same thing.

INTESTINE

Irritation of the small intestine gives a sensory reflex limited at first to the middle line of the body in the umbilical region, whilst irritation of the large intestine pain is felt in the middle line in the hypogastric region.

The viscerosensory reflex pain due to appendicitis is an exception to the rule, that pains excited by irritation of the intestine are felt principally in the middle line of the body, of course one would expect the pain to be on the right side in cases where the appendix is extra peritoneal, as we would then have a direct irritation of the ordinary sensory nerves. The small intestine is connected by the afferent nerves with the fifth to the ninth dorsal segments, the large intestine with the lower dorsal and the first three lumbar segments, the appendix being connected with the last two dorsal segments.

GALL BLADDER AND LIVER

The afferent sympathetic fibres reach from the seventh to the ninth or tenth dorsal segments, but the capsule of the liver, gall bladder and ducts are also supplied by the phrenic nerve, thus connecting it with the third and fourth cervical segments. The sensory reflex will therefore first be found in the left epigastric area and in the skin over the right side of the neck and shoulder.

The motor reflex is shown by the contraction of the upper part of the left rectus.

As the gall bladder is also supplied by the vagus we get a number of reflexes affecting other viscera as the heart, stomach, etc., but these we are not considering to-night.

Diseases of the liver only produce reflexes when the capsule covering it are stretched. They show themselves in the same regions as in gall stone colic.

KIDNEY AND URETERS

The sympathetic afferent nerves connect with the spinal cord from the tenth dorsal to the first lumbar.

The motor reflex is seen in the lumbar muscles especially in the region supplied by the last two dorsal and first lumbar nerve. Later it spreads forward involving the external and internal oblique and the transverses. The sensory is expressed at first by an aching pain in the back, and then extends round to the groin and testicle following the course of the first lumbar nerve. There is no pain felt in

the serotum as it is supplied from the sacral region.

BLADDER

The development of the bladder from two sources (the allantois and the cloaca) explains the two different sources of its nerve supply, one from the upper lumbar region, and the other from the second and third sacral supplying the fundus of the bladder, this also explains the two sets of reflexes which are excited when it is diseased, the one along the distribution of the upper lumbar nerves and the other in the perineum and external generative organs. The pain from overdistended bladder being felt above the pubis, and the pain from stone in the bladder in the perineum. Sometimes we get both reflexes as in acute inflammation of the bladder.

UTERUS

The body of the uterus is connected to the tenth, eleventh, twelfth dorsal and first lumbar segments by afferent sympathetic nerves; hence when there is a contraction of the body of the uterus we get a viscero-sensory reflex along the corresponding nerves, accounting for the pain at the upper level of the sacrum in the early stages of labor.

The os uterus has different connections namely with the first, second and third sacral segments explaining the cramps felt in the muscles of the legs in the later part of labor.

DISCUSSION.

W. E. Gardner: The essayist has discussed in a very scientific way a subject which is not well understood, and even many of the text-books on neurology devote little or no space to the consideration of visceral or organic reflexes. Dr. Thompson has based his argument upon the teachings of Sherrington, Head, MacKenzie and others who have given much study to this subject, along with his personal observations in this line during the last few years, and I must say his conclusions seem to be well-founded, i.e., that in some instances disease of the abdominal viscera may produce pain through the sympathetic independent of the central nervous system. This may be done through the protopathic sensory nerves which, according to Head, run in the sympathetic nerves to the viscera as well as to the skin, and give a low degree of sensibility, such as the appreciation of pain and temperature, but not to any delicate extent. The efferent fibers in the skin alone furnish a delicate and localized appreciation of pain.

As stated by the essayist, we know the skin and tendon reflexes have their centers in the cerebro-spinal axis, and some of them can be controlled by voluntary effort as they are concerned with striated voluntary muscles, where-

as the visceral reflexes have to do not only with voluntary muscles, but also with the involuntary non-striated muscles which are controlled by the sympathetic nervous system and are incapable of direct voluntary restraint, such as the muscles of the stomach, bladder, rectum and uterus. Such reflexes are performed independent of the central nervous system. Visceral functions go on unconsciously in the normal person, but may evoke consciousness when a cerebro-spinal sensory nerve is also stimulated, as in the act of defecation, involving the mucosa of the anal canal and the perineal muscles. The act then becomes a conscious one, and quite conscious in many instances, as most of us can testify.

The sympathetic and central nervous systems are connected by the "rami communicantes" through the sensory roots of the spinal nerves, and this accounts for the reflected pains in the abdominal walls according to the segment involved; and it is useful to bear in mind MacKenzie's rule: pain due to affections of the intestinal tract is referred across the middle line of the abdomen in regular descending areas from the stomach to the large intestine, epigastrium, umbilical area and hypogastrium. Purves Stewart says that a striking experimental corroboration of this can be obtained at any time by taking a sharp purgative drug; when the familiar colicky pains appear they are first in the region of the umbilicus, but soon descend lower and lower, and when they arrive close above the pubes the call for alvine evacuation becomes "urgent and imperative." We have here, of course, a concerted and co-operative action of both the sympathetic and cerebro-spinal nervous systems.

I have been impressed with the beautiful demonstration of the autonomic or para-sympathetic nervous system as shown on the charts displayed by Dr. Thompson. In these we note the mid-brain, hind-brain and sacral portions represented in blue; that the autonomic nerve fibers run directly from these to a viscus without passing through a ganglion as do the regular sympathetic nervous systems have opposing functions, that the sympathetic stimulates involuntary muscular contraction and the autonomic or para-sympathetic inhibits. An example of this is cited in the contraction and dilatation of the pupil, the autonomic nerve fibers running in the third nerve help to contract the pupil, while the regular sympathetic fibers from the ciliospinal center stimulate dilatation of the pupil.

Dr. Thompson's paper represents a great amount of work and study, and I have personally not had enough experience in affections of the sympathetic system to make more than these general observations on his most excellent resume of the subject.

George Hayes: One of the most interesting reflexes which Dr. Thompson has discussed concerns the third cervical area. The phrenic nerve arises in the third cervical region and we are too prone to think of it purely as a motor nerve, losing sight of the fact that it has considerable sensory distribution to the visceral pleura and pericardium. It not only supplies these membranes but also pierces the diaphragm and passes into the liver through the falciform ligament. In irritation of the visceral pleura or pericardium the pain is frequently referred to the third cervical region. On the other hand, in liver lesions, pain is often referred to the right shoulder. The sensory fibres of the phrenic nerve communicate freely with the sympathetic nervous system through semi-lunar ganglia, also with the diaphragmatic plexus and the superior cervical ganglion. It is possible that reflex pain may be carried through the sympathetic system to the superior cervical ganglion into the region of the third or fourth cervical segment.

Another cutaneous reflex which is of interest is the pain of angina pectoris which is referred downward along the inside of the left arm to the elbow or even to the little finger. Of course, in the latter case, it is an irradiation of the stimulus. We are always prone to think of the cutaneous sensory supply to the arm in terms of the brachial plexus, where as we must remember the second and third dorsal nerves also pass to the inside of the arm and supply it with cutaneous fibers.

John W. Moore: Pottinger in this country and Head, Sherrington and others in England have for several years been working along the lines mentioned by Dr. Thompson. Pottinger claims, and rightly so, that disease of the lung or bronchi reflexly produces irritation and rigidity of the muscles supplied by nerves above the fourth dorsal vertebra, that after a certain length of time the rigidity is replaced by muscular atrophy, this representing the type often seen in advanced pulmonary tuberculosis. Pleural disease causes irritation between the fourth and twelfth dorsal vertebrae with involvement of muscles in the chest wall. There is first muscular irritation and then atrophy.

In disease of the lung and pleura there is a peculiar type of muscular rigidity different from that noted about the abdomen, for instance, in appendicitis. In the latter disease deep palpation shows a board-like rigidity which remains. In the rigidity occurring in disease of the lung and pleura palpation causes relaxation of the muscles. I wish the essayist would, in closing, explain this phenomenon.

John J. Moren: The subject discussed by the essayist has been studied for many years; it is the old question of referred pain. Some authorities do not believe in referred pains, but I

long ago accepted the theory that referred pain may occur through visceral reflexes.

In my neurological work I am constantly confronted with vague and indefinite pains located in almost every portion of the body. Some of them are of diagnostic value, while others cannot be interpreted. One of the most perplexing manifestations with which we have to contend is pain at the top of the shoulder in neurasthenies. Whether it arises from visceral, cardiac or pulmonary lesions is a question. However we know it occurs most frequently in individuals below par physically.

There is another type of referred pain which has recently been prominently mentioned, i.e., spot-like pain in the left side near the angle of the shoulder, about the location of the spot pain noted in disease of the liver, that is dependent upon the so-called tachycardiac or "nervous heart." This was first studied by some English physicians who saw many such cases during the late war.

In visceroptosis there is always more or less referred pain. Patients with gastropptosis and coloptosis are likely to complain of various aches and pains, depending upon the degree of the ptosis. Fattening of such patients does more to overcome their aches and pains than any other measure of which I have knowledge.

Dr. Thompson has told us that the bladder is connected with the sacral segment of the autonomic or para-sympathetic system. Pain in the heel or penis is often due to vesical calculus. The explanation is that irritation of the sympathetic system occurs through the sacral segment and not through the lumbar segment, the penis and bottom of the foot being supplied by the sacral segment alone. The same rule holds good in other portions of the body, the only difficulty being to make an exact localization.

An interesting article appeared in the London *Lancet* during the war in which the authors tried to differentiate between malaria and trench fever by studying so-called hyperesthetic areas. They also tried to localize hyperesthetic areas in shell shock cases in an attempt to prove that shell shock was not dependent upon hysteria. A number of the patients showed change in the cerebro-spinal fluid, and that made them search for organic changes. Later Stewart, of Edinburgh, showed areas of hyperesthesia in various portions of the body arising from different segments of the cord. I have seen nothing further in the literature concerning this.

In attempted differentiation between malaria and trench fever, I remember it was stated that the heart reflex was thought to originate in the seventh dorsal. Dr. Thompson has told us the heart reflex arises in the first dorsal segment. Others claim it is in the eighth cervical, etc.

There is much food for thought in the excellent paper presented by Dr. Thompson. I believe the time is coming when the reflexes will be accorded greater consideration than heretofore and referred pains will be found reliable diagnostic guides.

Oscar E. Bloch: I remember having seen a patient some time ago with Dr. Thompson in whom there was presented a very interesting manifestation of referred pain to which I hope he will refer in his closing remarks. The patient had an irregular heart with pseudo-anginal pains occurring just over the deltoid muscle. I had never seen such a condition before.

I hope we will finally be able to make a positive localization and formulate some definite idea as to the cause of referred pain.

J. E. Hays: Careful study of the various reflexes is highly important to every practitioner of medicine, not only that we may be able to make earlier and more accurate diagnosis but more important still to strengthen the foundation for rational and efficient therapeutics. I hope the work will be continued until we can be of greater help to our patients.

J. R. Peabody: I cannot refrain from calling attention to some of the reflexes with which ear, nose and throat specialists are more or less familiar. For instance, the reflex from the ear which causes the patient to cough often seen in impacted cerumen. Reflexes from the auditory canal are probably carried through the chorda tympani to the vagus thus causing the patient to cough.

Another reflex commonly seen, especially in hospital practice among colored patients, is popularly known as "misery in the ear" from an abscessed tooth. I have also seen this manifestation in white persons.

L. W. Frank: Dr. Thompson's paper is especially interesting to surgeons because it illustrates some of the ways errors in diagnosis are made. There is no question that many patients with renal or ureteral calculi are operated upon for appendicitis. This is due entirely to misinterpretation of visceral sensory and motor reflexes. In the presence of ureteral calculus without the typical syndrome, i.e., pain radiating to the bladder, downward on the thigh, with blood in the urine, the patient is likely to be operated upon under the diagnosis of appendicitis, because associated with ureteral pain there is a visceral motor reflex with muscular rigidity in the right abdominal quadrant and reflex gastric phenomena the same as in appendicitis. The paper emphasizes the fact that we should always be on our guard in diagnosing abdominal pathology and take into consideration the various reflex phenomena.

I understood Dr. Thompson to say it was contraction of smooth muscle fibres which pro-

duced pain in hollow viscera such as the stomach and intestine. According to the present theory of peripheral referred pain, should such pain be produced by contraction of the smooth muscle fibres of a hollow viscus, it would be referred through the terminal nerve at a corresponding level in the cord. In this connection I would like to ask Dr. Thompson why the pain moves in spasmodic conditions of the large intestine unless there are definite sensory fibres which can be interpreted as such in the central nervous system. According to my understanding the large intestine has no terminal nerves.

Owsley Grant: In my special line of endeavor the study of visceral reflexes as described by Dr. Thompson is of much value in determining not only the organ in which the pain originates, but in furnishing in some respects a clue as to the type of offending pathology. Remembering that nearly all of the afferent, or receptive nerve fibres are responsive to only one kind of stimuli, that is to pain, to heat, to pressure, or some similar type we can readily see how this may be helpful in the diagnosis differentially in the genito-urinary tract. The radiation of pain in stone or obstruction of the ureter is a very characteristic thing when present, so much so as to be almost pathognomonic in fact. Ordinary impacted stone and stricture of the ureter causing obstruction give a different picture of the referred pain from that of a small calculus moving down the ureter, the pain in the former is always located in one place in the same individual, while in the latter it may migrate to great distances. Considering the fact that so many of the calculi in the ureter are not shown by the X-ray this factor becomes well worth our study. One very interesting point Dr. Thompson brought out, namely, that the upper and lower parts of the bladder are supplied by different nerves, springing from different sources. This means that pain of distention and involvement of the vault of the bladder is referred to the abdomen, and also any pericystitis of this portion of the bladder, while pain in the trigone and in the prostatic portion of the bladder is referred to the perineum. The study of reflexes is of great importance in urological work.

Henry Enos Tuley: When one approaches this subject it is apt to be with the feeling that it belongs largely within the domain of the dreamer. Dr. Pottinger called attention to the method described by Dr. Thompson as a means of differentiating between diseases of the chest and abdomen, and the practical application of the method in his hands seems almost uncanny. I have seen him (Pottinger) in his first examination of a patient make an absolute diagnosis of tuberculosis and demonstrate the location and extent of the disease. His method of palpation to localize the various reflexes is wonderful.

In illustration of the practical value of Dr. Thompson's remarks, I wish to say that I have seen the abdomens of several children opened for supposed appendicitis and perfectly healthy appendices found, the pathology being in the lower portion of the chest, i.e., pleurisy or pneumonia. Referred pain is very important particularly in the diagnosis of diseases of children when the lower portion of the lung or pleura is involved.

The point I would emphasize is the importance of the method Dr. Thompson has described in the differential diagnosis between diseases of the lower chest and upper abdomen.

Cuthbert Thompson, (closing): In reference to the two cases referred to by Dr. Tuley in which diaphragmatic pleurisy was mistaken for appendicitis, Cappa in his article on "Diseases of the Pleura", in *Oxford Medicine* refers to nine such errors. MacKenzie also refers to this, and says that this error is more liable to occur in children.

The pleura covering the outer third of the diaphragm is innervated by the sensory fibres of the lower five dorsal nerves, and as fibres from these same nerves supply the skin and muscles of the abdomen, it is easy to see how this error in diagnosis occurs.

I am glad Dr. George Hays referred to the sensory reflexes produced in diseases affecting organs supplied by the phrenic nerve. The pain felt at the top of the right shoulder in cases of gall stones, is a reflex pain, in which the afferent fibres of the phrenic conveys the stimulus to the cord and the pain is felt in the region supplied by the fourth cervical nerve. I have two such cases recently diagnosed as neuritis of the arm.

Dr. Moore referred to the work of Pottinger. I had the pleasure of seeing Pottinger demonstrate his method of diagnosis about a year ago. In disease of the lung the afferent sympathetic nerves connected with the cervical part of the cord are affected and reflexes are noted principally in the supra-clavicular region. In disease of the pleura the intercostal nerves are affected.

The question was asked why the skeletal muscles in tuberculosis were first rigid and later soft on palpation. The muscles remain contracted for a time owing to the continued irritation of the lung. Later the rigidity disappears and relaxation occurs as the muscles begin to atrophy. There is not only atrophy of the muscles but also of the glands in the skin.

Dr. Moren referred to pain produced by viscer-
optosis: When there is a sagging of the viscera there is a drag on the normal supports which pulls on the peritoneum and irritates the deep layer of fibrous tissue just outside the

parietal peritoneum, which is richly supplied by sensory nerves.

The question of shell shock was referred to: We see many soldiers who met with accidents in the war which produced painful stimuli which lasted a long while. These men are neurasthenics because of irritating foci thus produced in the brain or cord, and now slight provocation renews the irritation. These irritable foci may account for tremors or other nervous manifestations, as it takes very little stimulus to re-excite this irritable area.

Dr. Bloch mentioned a case of angina: This patient suffered very severe pain in the left arm. I believe it was due to a visceral sensory reflex from the heart. The arm muscles were in a state of tonic contraction which suggested tumor formation, the viscerosensory and motor reflexes were so marked, there was also violent spasm of the intercostal muscles supplied by the second and third dorsal nerves. After the heart condition improved the pain and spasm in the arm was relieved.

I believe Dr. Moren referred to different efferent nerves being affected in heart disease. The afferent nerves of the internal organs which convey impulses to the cord are not invariably the same; hence the reflex pain will not always be felt in the section of the skin. Moreover, irritation of a segment of the cord may occur and the reflex may not only be referred through its own segment but also through the segment above or below.

I agree with Dr. J. E. Hays that the study of these reflexes will aid us in the earlier diagnosis and changes that have occurred and while the disease may be amenable to treatment.

As to the question of herpes: We know herpes is due to irritation of nerve ganglia of the posterior roots of the spinal nerves, but the pain is often described as if it were felt deep in the body. While the lesions are superficial still the patient complains of pain in deep parts of the body, such as the liver, kidney, etc.

Dr. Peabody referred to cough due to irritation of the external ear: This is explained by stimulation of a branch of the vagus nerve, it is a reflex cough due to irritation. However, the scope of my paper was limited to visceral reflexes as manifested on the surface of the body. Other reflexes were not discussed.

Dr. W. Frank referred to pain in cases of intestinal obstruction: In the paper I stated that the pain is reflex due to violent peristaltic action, and the peristalsis begins higher up in the intestines and ends at, or just above the site of the obstruction, hence as the peristaltic wave passes down the bowels the position of the reflex pain felt in the abdominal wall moves likewise.

CEREBRO-SPINAL MENINGITIS: RECOVERY. CASE REPORT.*

By BENJAMIN F. UNDERWOOD, Louisville.

On October 21, 1919, at nine o'clock p.m., I was called to see J. A., a male, aged eight years. Examination revealed marked opisthotonos; Kernig's sign present; slight delirium; no headache nor pain. Temperature 102 degrees F., pulse 110, respirations 28. On the 22nd the temperature was 103 degrees F., pulse 120, respirations 36. Spinal puncture was made, 17 cc. cloudy fluid removed and 15 cc. antimeningitis serum injected. Examination of the spinal fluid disclosed the presence of meningococci.

October 23rd, temperature 99.2 degrees F., pulse 76, respirations 28. Spinal puncture, 16 cc. cloudy fluid removed, 15 cc. antimeningitis serum injected. On the 24th, temperature 101 degrees F., pulse 90, respirations 28. Spinal puncture, 15 cc. clear fluid removed, 15 cc. antimeningitis serum injected. On the 25th, temperature 100.2 degrees F., pulse 80, respirations 26. Spinal puncture, 17 cc. clear fluid removed, 15 cc. antimeningitis serum injected.

October 26th, temperature 99.4 degrees F., pulse 84, respirations 25. General condition of patient good. On the 27th, temperature 100.2 degrees F., pulse 88, respirations 24. On the 28th, temperature 100.2 degrees F., pulse 86, respirations 26. On the 29th, temperature 98.8 degrees F., pulse 82, respirations 26. On the 30th, temperature 100.2 degrees F., pulse 100, respirations 22. On the 31st, temperature 102.4 degrees F., pulse 100, respirations 28. Patient complained of slight headache. Spinal puncture, 22 cc. cloudy fluid removed, 15 cc. serum injected.

November 1st, temperature 100 degrees F., pulse 90, respirations 26. No headache nor delirium. On the 2nd, temperature 99.4 degrees F., pulse 90, respirations 26. On the 3rd, temperature 103.3 degrees F., pulse 72, respirations 24. Spinal puncture, 17 cc. fluid removed, 15 cc. serum injected. On the 4th, temperature 100 degrees F., pulse 90, respiration 27. On the 5th, temperature 104.3 degrees F., pulse 120, respirations 28. Spinal puncture, 17cc. fluid removed, 15 cc. serum injected. On the 6th, temperature 100.2 degrees F., pulse 90, respirations 28. On the 7th 20 cc. fluid removed and 15 cc. serum injected. On the 8th removed 25 cc. fluid and injected 15 cc. serum.

November 9th, 20 cc. fluid removed and 15 cc. serum injected. Examination of fluid negative for meningococcus; no leucocytes pres-

ent. On the 10th, blood culture negative. Guided by these findings the use of serum was discontinued.

November 19th Dr. Philip F. Barbour was called to see the patient and suggested trying a different kind of serum. On the 20th 50 cc. fluid removed and 30 cc. of "Mulford's" serum injected. At one o'clock a.m., patient delirious; 15 cc. serum given intravenously. On the 21st 15 cc. serum intravenously. On the 22nd 40 cc. fluid removed and 30 cc. serum injected. On the 24th 35 cc. fluid removed, 30 cc. serum injected. Examination of fluid showed presence of meningococci. On the 26th 15 cc. fluid removed and 15 cc. serum injected. On the 28th 16 cc. fluid removed and 15 cc. serum injected. Examination of fluid showed no meningococci present.

December 1st Dr. Barbour again called in consultation; 17 cc. clear fluid removed and 15cc. serum injected. On the 2nd 15 cc. serum given intravenously which was followed by marked reaction; adrenalin and atropine used. On 4th, 17 cc. fluid removed and 15 cc. serum injected. Fluid clear; no pus cells found. On the 5th the patient had several spasms. Dr. Barbour was called and administered chloroform for about fifty minutes, 15 cc. serum given intravenously. On the 5th 30 cc. serum intravenously. On the 6th 30 cc. serum intravenously. On the 8th 30 cc. serum intravenously. On the 9th 50 cc. fluid removed and 30 cc. serum injected. Patient was stupid and did not feel spinal puncture. Examination of fluid, no meningococci nor pus cells present. On the 10th 25 cc. serum intravenously. On the 11th 15 cc. clear fluid removed and 15 cc. serum injected. On the 12th 15 cc. serum given intravenously. On the 14th 60 cc. fluid removed and 30 cc. serum injected.

December 16th one hundred million meningococcus vaccine given subcutaneously. On the 18th spinal puncture removed 50 cc. spinal fluid; gave meningococcus vaccine five hundred million, which was followed by chill, temperature 104.5 degrees F., pulse 130, respirations 36. The patient certainly had a severe reaction, but from this time on recovery was rapid.

My reasons for reporting this case are: (1) The length of time the acute symptoms lasted, from October 19th to December 21st, sixty-three days. (2) The great number of spinal punctures and large quantity of serum used, twenty-one spinal punctures, 375 cc of serum administered, nine intravenous injections 195 cc. of serum administered, makes a total of 570 cc. of serum used. (3) Prompt recov-

*Read before the Jefferson County Medical Society.

ery following the use of meningococcus vaccine.

Doctors Coon and Barbour were associated with me in the case and can probably tell you some of the things I have omitted.

DISCUSSION:

Geo. S. Coon: I saw the patient several times with Dr. Underwood, and the cure is certainly remarkable. It appears from the report that vaccine was the principal agent of importance in production of the cure. It was a question whether the administration of vaccine would be safe. I believe one or two cases have been reported where it was claimed the use of vaccine after giving a large quantity of serum was a dangerous procedure. In this case the cure in my opinion, was remarkable, and the vaccine evidently played an important role.

The case is one from which a lesson may be drawn for future use in similar cases. We would not hesitate, when the patient is not doing well and spinal puncture has lost its effect, to administer vaccine with every expectation of satisfactory results.

The length of time the disease continued is remarkable. Very few cases of meningitis persist that long. It was a case of typical acute cerebro-spinal meningitis. Examination of the spinal fluid showed the diagnosis to be correct.

B. C. Frazier: I wish Dr. Underwood would tell us in closing how long convalescence lasted after the patient began to improve.

W. E. Gardner: Undoubtedly the claim made by some of the older observers still holds good, that withdrawal of the spinal fluid in cases of meningitis will save the life of the patient. The spinal fluid re-forms rapidly, and if the doctor had not made frequent spinal punctures the child would probably have died.

It is probable that much good was accomplished by antimeningitis serum before vaccine was used. Apparently the vaccine was an important factor as suggested by Dr. Coon, yet the disease was held in check by numerous spinal punctures and introduction of serum and the importance of this fact should not be forgotten. The spinal fluid, I understand, was, always under high pressure when withdrawn.

Dr. Underwood should be commended for the amount of time and patience he took in this case, as many such cases have been considered hopeless, after the patient did not improve with the administration of a few doses of antimeningitis serum. We know, now, however, that frequent spinal punctures and many doses of serum are required to save such a case.

Leon K. Baldauf: I think there is a decided tendency on the part of certain physicians to overtreat cases of meningitis, and this overtreatment is not without danger. The belief

among those who have had considerable experience with the serum treatment is that in the majority of cases where a considerable amount of serum has been given intraspinal and intravenously and where the spinal fluid remains slightly cloudy with a little temperature, that the patients do better without further treatment. I recall a case of this kind in the Louisville Public Hospital. When the temperature receded to 99.5 F. or lower and the fluid continued slightly cloudy, treatment was discontinued and the patient recovered. Dr. Bloch will recall a case I saw with him. The patient had received large amounts of serum intraspinal. About that time Herrick's paper was published advocating intravenous use of antimeningitis serum, and this method of treatment was tried. I think this was the first case in which serum was given intravenously in Louisville. We injected about 30 c.c. and I was never more frightened in my life. In about fifteen minutes the patient had a severe chill which lasted half an hour. He received no more intraspinal nor intravenous treatment, but improved rapidly and eventually made a satisfactory recovery.

F. T. Fort: I believe some meningitis patients are doomed from the beginning. I saw a large number of such cases while in military service. I treated none of them medically, but was asked to see many of the patients by the chief of the medical service, and had to extract portions of needles which had broken and had remained in the back after spinal puncture, etc. I have known of men to have an acute attack of meningitis while on the field and literally "drop in their tracks" who never regained consciousness after being brought into the hospital. I do not believe in these malignant cases that anything can be accomplished by treatment.

I agree with Dr. Baldauf that many of these cases have been over-treated. Some of them will die no matter what you do; some will die from over-treatment; some will get well without treatment; some will recover in spite of treatment and regardless of what may be done for them.

F. C. Askenstedt: Dr. Fort's remarks remind me of a case of meningitis I had under observation some time ago. The patient was a boy aged twenty years who had opisthotonos, severe pain, and temperature of 104 degrees F. It looked like a serious case from the beginning. I tried to introduce a needle into the spinal canal for the purpose of withdrawing some of the spinal fluid, and failed. Dr. Humphrey was then called and tried to insert the needle, and also failed. Consequently the patient received no serum by intraspinal introduction, nor was any of the spinal fluid withdrawn. I administered simply some homoeopathic medicines—cimicifuge and gelsemium—and the patient made a

complete recovery without a single complication.

B. F. Underwood, (closing): Answering Dr. Frazier's question: The boy's recovery, as stated in my report, was very rapid after I began the use of vaccine; convalescence was thereafter without untoward incident. In addition to the treatment mentioned, he had olive oil baths twice daily.

With respect to Dr. Baldauf's statement about over-treatment: This boy was given four doses of serum intraspinaly, and then the injections were discontinued. The temperature again rose to 103 degrees F., and he had another convulsion. After another series of intraspinal injections the treatment was again discontinued followed by marked rigidity and convulsions. Every time serum was discontinued the temperature rose and convulsions began. We thought several times the patient would die. We then began using serum intravenously with no better results, and then decided to try vaccine. Nobody had used it in Louisville so far as I could ascertain, nor did anybody else with whom I talked know anything about the method. Following this mode of treatment recovery was rapid.

INDICATIONS FOR REMOVAL OF THE FAUCIAL TONSILS.*

By S. SHELTON WATKINS, Louisville.

During the last few years the speaker has had occasion to examine a large number of patients who have had their tonsils removed. In most cases, in his opinion, the operation was indicated, but in quite a number it was not justified. So, notwithstanding a very extensive literature upon this hackneyed subject, there is still much confusion. Therefore, the purpose of this paper is to try to help clarify the situation.

The indications for tonsillectomy may be divided into local and systemic groups.

Local indications in turn, may be classified under six heads. They are:

1st. Hyperplasia. Large tonsils which interfere with breathing, speaking or eating should be removed.

2. History of Repeated Attacks of Acute Inflammation Regardless of the Appearance of the Tonsils. Some patients will give a very definite history of several attacks of tonsillitis and yet their tonsils will not appear to be any more diseased than those of others who have not had any attacks; this is, however, unusual. A history of quinsy once justifies removal of tonsils because of the large amount of adhesions produced thereby.

3. Chronic Inflammation. This is determined, clinically, by enlarged glands at

the angles of the jaw; by adhesions to the pillars and by roughness of the surface of the tonsil causing it to be somewhat lobular. The first two signs are more often observed than the last, and one or the other should be present before a diagnosis of chronic inflammation is made. The large glands are not as frequently found in adults as in children. Only glands one-half inch or more in diameter should be considered enlarged. The size is not an indication of inflammation. Small ones are just as apt to be foci of infection as large ones; in fact, the more scar tissue, the more contraction of the tonsil. Crypts are normal and they contain a small amount of tissue debris and food, which usually does not cause trouble, but, when they are dilated or cystic and contain much foul, cheesy or purulent material, they are abnormal and are a source of danger to the patient.

Most patients who have chronic tonsillitis will give a history of more or less sore throats, dysphagia, fever, etc., but sometimes they will deny having had any symptoms. It should be remembered that some patients are forgetful; some consider slight attacks not worth mentioning; and others purposely deceive because of the fear of an operation. Therefore, negative histories should have little weight in the presence of definite clinical findings.

4. New Growths. With a few exceptions, it is best to remove all tonsils that have new growths. When malignant tumors have invaded the surrounding tissues and there are extensive metastases to the lymph glands, it is best to remove only a small piece for microscopical study and to try radium treatment. Any operative procedure will be mutilating and useless. Lympho-sarcoma of the tonsils is destroyed very rapidly by radium and, usually, an operation is not necessary in such cases. A simple polyp upon the epithelium is not an indication, but it should be watched in older persons. Tonsils containing benign tumors, or small malignant tumors which have not invaded the surrounding tissues or extensively metastasized, should be removed for more thorough microscopical study and, as a preventive measure. This is especially true of papillomas in persons over forty, as they often become malignant.

5. Diphtheria Carriers. Nearly all carriers can be eliminated as such by a tonsillectomy and, of course, also an adenoidectomy. The bacilli deeply invade the crypts and usually no other treatment will remove them.

6. Certain Unusual Conditions. Vincent's angina and chancre of the tonsil are indications for removal after the acute symptoms have disappeared. Tonsileliths and

*Read before the Jefferson County Medical Society.

keratosis of the tonsils are also indications for removal; especially, in the case of the latter when other treatments have not given relief. Another indication is paroxysmal nocturnal cough in children.

The Systemic Indications may be classified under nine heads as follows:

1. Chronic Inflammation of the Upper Food and Air Passages. In this group, there are many conditions, more or less serious, which may be secondary to a chronic tonsillitis. They are pyorrhea alveolaris, pharyngitis, nasopharyngitis, Eustachian salphingitis, otitis media and laryngitis. It is more often that a chronic tonsillitis is caused by a bad case of pyorrhea, although cases of the latter are greatly helped by removing infected tonsils, but not infrequently the tonsils are the cause of stubborn cases of infection in the other neighboring structures just named. The adenoids, if present, teeth and gums and the accessory nasal sinuses may also be foci and must be ruled out. When there is a chronic catarrhal otitis media which is progressive and no other cause found, it is best to remove the tonsils even when there is doubt of infection of same, since it is wise to give the patient the benefit of the doubt. The loss of practical hearing is a serious injury; the loss of the tonsils is not.

2. Mild Gastro-Intestinal Upsets. The speaker means those cases in which nausea, gas eruptions, slight regurgitation and, occasionally, diarrhea are the symptoms. Many of these cases are due to the frequent swallowing of infectious material from the upper food and air passages and often the tonsils are the focus. When pain after meals and vomiting are present, there is apt to be a more serious gastric condition, such as an ulcer or a new growth. The relation of infected tonsils to gastric ulcers is still debatable, but undoubtedly some cases of the latter are secondary to the former. Reflex vomiting in young children may be due to the tonsils.

3. Simple Infections of the Lower Air Passages.—Tracheitis, bronchitis and broncho-pneumonia are not infrequently caused by diseased tonsils. Repeated acute attacks are the rule. Chronic inflammation of the lower air passages are due more often to tuberculosis or bronchiectasis than to an infection from above.

4. Tubercular Cervical Adenitis. Were it practicable to make serial sections of all tonsils that are removed from patients who have tubercular glands of the neck, probably a very high percentage of them would show tubercles. As it is, a fair percentage show them when only one or two sections from each tonsil are studied. There is no doubt that the

tonsils are often the portal of entry for the tubercle bacillus when it attacks the cervical glands. So whenever tubercular cervical adenitis is discovered, the tonsils should be removed, whether or not the glands are operated upon; and the sooner the better. This likewise applies to the adenoids.

5. Infectious Arthritis, Acute Rheumatic Fever and Myositis. The tonsils are frequently a focus of infection in these conditions. Sometimes when there is little or no history of local trouble and sometimes when they appear harmless, the tonsils will, nevertheless, be the cause of a very troublesome arthritis or myositis. It is not often that an attack of arthritis directly follows an attack of tonsillitis and a history of one following the other must not be expected; sometimes the joints become inflamed much more often than the tonsils. Not infrequently in arthritic cases, the joints are worse following an operation. The chief cause of this is, probably, the weakened condition of the patient produced by the operation.

6. Endocarditis and Chorea. These conditions are often related in children and so are grouped together, but they may occur independently. The tonsils are not an infrequent focus and most cases improve rapidly after the operation. Of course, the operation should not be done when either is acute, and it should be postponed three or four weeks after the acute symptoms have disappeared. In adults with heart lesions, the history and examination of the tonsils are often practically negative and an operation in these cases should be deferred until more likely foci have been treated, or until there are symptoms which indicate that the disease is progressing.

7. Acute and Sub-acute Nephritis. As in all acute infectious diseases, albumen may be found in the urine during acute tonsillitis, but when casts and red blood corpuscles are also found there is an acute nephritis. Usually, it follows soon after rather than during the attack of tonsillitis. About two months after the acute symptoms of nephritis are over, the tonsils should be removed.

8. Elevation of Temperature Without An Apparent Cause. The temperature may be septic or there may be just an evening rise. When the latter is the case and a general physical examination is negative, the tonsils themselves may be tubercular and causing the temperature. The speaker has seen such cases. When the temperature is septic, it is usually not very irregular, with only moderate rises and falls. There are also general pains and aches over the body. The tonsils in such cases should be removed, provided the general physical study is negative. The patient should be observed for a week or two,

unless his condition is serious, before operation.

9. Some Cases of Anemic and Mentally Retarded Children. The tonsils are more often at fault in the former and the adenoids in the latter. Usually there are other good indications for removal of both. The improvement after operation in these cases is often most impressive and gratifying.

Among the conditions which some consider as indications for tonsillectomy, but which are rarely or never relieved by the operation, may be mentioned:

1. Bronchial Asthma. It is very rare that a tonsillectomy has any effect in relieving these sufferers.

2. Arthritis Deformans. Operation does no good and rather often is harmful.

3. Chronic Nephritis. Usually it is too late to help the patient and frequently the general condition will not permit an operation. If the nephritic condition is mild and tonsils are badly infected, remove them.

4. Chronic Suppurative Otitis-media. In adults this condition is nearly always secondary to bone necrosis within the middle ear or mastoid. Often in babies and in young children (and sometimes in adults) adenoids are the cause, and, usually, after removing them the ears will soon heal.

5. Essential High Blood Pressure. This is not often due to a focus of infection in the tonsils. Other factors, as endocrine disorders and early arterio-sclerosis, must be considered. The tonsils should not be removed except in very suspicious cases and, after a thorough general study.

6. Irido-Cyclitis. In so-called "rheumatic" cases a focus of infection is frequently the cause. Abscessed teeth or a sinus infection are more apt to act as a focus than the tonsils, but sometimes the latter are. Of course, lues, by far the most frequent cause of this condition, must be ruled out by a Wassermann, etc.

7. Exophthalmic Goitre. Is not an indication; but rarely, acute thyroiditis follows acute tonsillitis, and in such cases the tonsils should be removed.

8. Urethritis. Some claim that infected tonsils are a frequent cause of this condition, but it has not yet been proved to be the case.

9. Enuresis Nocturna.
 10. Epilepsy,
 11. Psychasthenia,
 12. Orthostatic Albuminuria,
- Are not indications.

CONCLUDING REMARKS.

Before the tonsils are removed, as the probable cause of the various disorders due to focal infections, the other foci should be ruled out. The most important ones are adenoids, accessory nasal sinuses, teeth, the prostate and the seminal vesicles, the gall bladder, the appendix and caecum and a dilated, sluggish colon. Sometimes there are two or more foci of infection. In such cases, the most probable focus should be treated first unless the patient's condition requires quick relief, when all foci should be treated at once. Extraction of important teeth should be strongly discouraged, since it is very difficult to satisfactorily replace them with false teeth. The loss of necessary teeth is a permanent discomfort and becomes very serious when wholesale extraction is done, as too frequently is the case. The percentage of diseased teeth which cause systemic infection is probably much smaller than is generally supposed. Of course, when they are causing serious trouble, they should be removed but too many men assume that they are doing so merely because they are diseased and don't make an effort to first treat other more likely causes. It must not be forgotten that one focus of infection may cause another. For example, badly infected teeth may infect a sinus or either may cause tonsillitis. When there is a serious systemic disorder, a general physical examination and tests, especially the Wassermann, should be made to rule out other causes.

CASE FOR DIAGNOSIS: PRELIMINARY REPORT.*

By BEN CARLOS FRAZIER, Louisville.

Today (November 12, 1920) about noon, I was called to see a woman aged sixty-four who presented a rather curious condition, on which the following is a preliminary report. According to the history given me, the patient went to her room about ten o'clock to dress preparatory to going out; at ten-thirty her sister found she had made no attempt to get dressed; that she was very much confused mentally, and stated she did not appear to know what she was doing, etc. Before my arrival the feet of the patient had been placed in hot water, and an ice bag had been applied to her head.

When I entered the room she said: "who are you? I was expecting Dr. Powell." When asked who Dr. Powell was, she replied: "why you know old Dr. Powell, the man who brought us all into the world." At this time

*Clinical Report before the Louisville Medico-Chirurgical Society.

she had a pulse of 68, temperature normal, and with the exception noted, seemed able to talk coherently. She said she had slept well the night before, but seemed not to remember anything which had occurred that morning. I prescribed a mixture containing calomel, and told her sister to telephone me later in the day. About four o'clock she reported that the patient had only shortly before apparently "come to herself." She had no recollection of my having been there, and only within the last half hour had she become normal.

The case appeared a little unusual to me, there was no pupillary disturbance; co-ordination seemed to be perfect; she talked coherently while I was there, excepting that she said "she was looking for Dr. Powell," and was surprised when I entered the room. Micturition and defecation had occurred several times during the afternoon. A specimen of her urine examined about four o'clock showed: specific gravity 1007; reaction acid; no casts.

I might add that this patient has had mild nephritis for several years and her blood pressure has occasionally been high; but at no time have I seen her when she was really ill during the twelve years she has been under observation. Two years ago she spent the winter in the east, and while there said some doctor found her blood pressure very high and gave her some treatment.

DISCUSSION:

L. W. Frank: Not infrequently in elderly people, especially toward evening when the circulation becomes sluggish, a syndrome is presented similar to that described by Dr. Frazier. Sometimes paralysis ensues, and these are the cases of paralysis, which later recover. This patient gives a history of high blood pressure at various times; we do not know what her blood pressure was at the time of this attack. I think in many instances the symptoms of cerebral thrombosis develop slowly, and paralysis may or may not appear later. It would be interesting to follow the case reported to see what happens later.

Elderly people often retire feeling perfectly well and awake the next morning with paralysis. Often these are cases of cerebral thrombosis.

Contagiousness of Epidemic Encephalitis.—The three children in the family described by Levy developed epidemic encephalitis with intervals of two and four months. The girl of 13 died.

A NEW METHOD OF CLINICAL RESEARCH.*

By Fritz C. Askenstedt, Louisville.

Clinical research at the present time is confined almost entirely to larger institutions, such as hospitals and colleges. The reason is that the required series of investigations, clinical, laboratory and post-mortem, can be attempted only by a corps of well-trained specialists. The subjects are usually patients admitted in an advanced stage of disease, presenting gross alterations of tissues. In fact, unless such alterations, ascertainable by physical examination or revealed by the microscope, are present the subject is not considered fit for investigation. There is no denying that this method of research has proven of inestimable value, and has been the foundation for the considerable scientific advance made in medicine during the past century. But it has seemed to Sir James Mackenzie that opportunities for clinical research of even greater importance have been neglected—opportunities to investigate disease in its very earliest manifestations, before physical changes are in evidence, a stage when probably every disease is amenable to proper treatment. This early stage is manifested, as a rule, by subjective symptoms rather than by physical signs. To use his own words: "There is at first sight a great similarity in the sensations experienced by patients who feel 'out of sorts,' and most people see no likelihood of any further knowledge of the complaint to be obtained from a careful inquiry. To the untrained eye the members of a flock of sheep are so like one another that it seems impossible to recognize separate individuals, yet the intelligent shepherd knows the peculiarities of each individual, though he might not be able to give a comprehensive description of the features by which he differentiates them. There are shades and varieties in the sensations produced by disease, which are hidden from the untrained observer. If these were clearly differentiated, and if the mechanism by which they were produced were understood, I feel confident we would get a knowledge of disease long before it has done much damage to the constitution, or has put it in peril. I have shown how some of the more obvious sensations, as pain and exhaustion, have yielded a limited amount of information. There are many sensations which have some very definite cause producing them. A systematic effort made to detect these sensations,

*Read before the Jefferson County Medical Society.

to differentiate them clearly, and to note their coming and going, and their association with other phenomena, would throw an unexpected light on the early phases of disease." It is to the investigation of these early evidences of disease, be they subjective or objective, evidences regarded by the average observer as without significance, that Mackenzie has of late years been directing attention. Such research work must obviously be carried out on lines different from those adopted by the hospitals. It involves early contact with the patient, a careful recognition and analysis of individual symptoms, hitherto deemed negligible, and a close study of their associations. Besides, the course of these symptoms, their susceptibilities, their natural terminations, and their amenability to treatment must be watched from this early period for a considerable time, often for many years. It is very evident that for this new line of investigation, the hospitals are entirely inadequate. This, the most important work of medical research for the future, devolves, therefore, upon the general practitioner and upon such institutions as are in a position to note, like the family doctor, the history of the subject during a considerable part of his life. Fortunately, in comparison with present day hospital research, with its ever-increasing complexity of paraphernalia and laboratory procedures, the new method of research is, in its beginning direct and simple. Recording the first sensations of ill-health, with their attendant scanty physical evidences, "is less a matter of laboratory experience than a tactfully conducted inquiry and an exercise of the unaided senses of observation. Thus to every practitioner there is afforded an opportunity to engage in the most important research work of the future. Mackenzie's professional career before attaining fame is a striking illustration of what can be accomplished by the general practitioner independent of hospital advantages, and as important a discovery as auricular fibrillation, its symptomatology, its relation to heart failure, its response to digitalis, he says, "could not have been made out by investigators however capable, if they had restricted themselves to laboratory or hospital wards."

To carry out this new idea of clinical research, Mackenzie had organized a medical staff in the Out-Department of London hospital. It was found, however, that a large city, with a number of free dispensaries, like London, was not suited to the purpose, inasmuch as the patients would consult one dispensary after another, thus preventing a proper observation of individual cases for a sufficient length of time. Consequently he decided upon a more favorable location, and removed

last year to St. Andrews, a city of about 8,000 conservative Scotchmen, located less than a hundred miles north of Edinburgh. Its six physicians were all included in the medical staff of the new institute, and each one was pledged to furnish a written standardized report of all his future patients, both dispensary and private. In this way there is practically no escape by a patient from continued observation by the Institute, except through removal from the city, death, indeed, being usually followed by an autopsy. A few laboratory men were added to render the work complete. Meetings are held every week, at which the report of cases are submitted to the entire staff for discussion and criticism. The work is as well systematized and correlated as if done by a single individual, the family physician. It is as yet too early to estimate the practical value accruing to medicine from this work, but the great strides of advance already made by Mackenzie's personal work on cardiac irregularities, on the significance of pain ("Symptoms and Their Interpretation," 1912.) and later on exhaustion, were attained by those methods of investigation upon which the new Institute is founded, and this bespeaks for it an advanced place in future clinical research.

What is being done at St. Andrews can, at least to a lesser extent, be accomplished in other small communities or by any one general practitioner in any locality. The methods of organization and work will naturally vary with the personnel and the conditions prevailing in each place, but, in the main, the same principles will apply to all. To those interested Mackenzie's recent work on "The Future of Medicine" is recommended for a more extensive exposition of the principles of research. The following methods pursued at St. Andrews may offer suggestions of value to physicians of other communities desiring to add their quota to the advance of medical science:

1. Each clinician has a private room in the Institute. This is reserved from 11 to 1 on Mondays, Wednesdays and Thursdays for research cases. During the rest of the day each practitioner may use his private room as a private consulting room. Two panel practitioners have adopted this plan for all their patients. They have thus the advantage of the use of the scientific departments whenever required. In each room an index file and cards are provided upon which brief notes are kept of each private or panel patient. These cards will, in time, form records of the life history of each patient. In the event of a patient removing to another district these notes can be sent to his new attendant.

2. Cases for research are selected from his own practice by each member of the clinical staff. These are, in the first instance, seen by him, and he is at liberty to consult Sir James Mackenzie or any colleague at any stage of the case. If any special investigations are required, these are carried out by the staff of the special departments.

3. On Tuesday afternoons some special subject, arranged beforehand, is discussed by a general meeting of all members of the staff.

4. On Friday afternoons the whole staff discuss the cases seen during the week, and any suggestions for investigation of any case made at that meeting are proceeded with and added to the record.

The success of the work depends so largely upon accurate recording of cases that the system formulated by Mackenzie, though still regarded by him as tentative, is worthy of most careful consideration. But whether engaged in research work or not, a physician can not well afford to trust his observations to memory's fitful guardianship when in many unsuspected instances great consequences are at issue. The time required in keeping satisfactory clinical records can not be spent to better advantage, for it affords the examiner an education in accuracy of observation, a more definite knowledge of the progress of the case, and will win for him a deeper appreciation of his professional solicitude and competency. Without systematized records no man can attain eminence in the medical profession. The following system of case-taking is at present employed at St. Andrews:

Duties of the Doctor.

1. Elicit clearly the sensation which led the patient to the belief that he was ill.
2. Elicit other sensations associated.
3. Have a clear idea in mind as to the information to be elicited by questions.
4. Never leave a particular symptom until fully investigated.
5. Use questions suitable to the patient's understanding.

Patient.

1. Main complaint (details of).
2. Associated sensations.
3. Origin and history of present complaint.
4. Questions to elicit other associated sensations.
5. General survey of each system or organ by questions.
6. Previous health.
7. Family surroundings. Home surroundings. Habits, etc.
8. Physical examination: (a) General appearance (physiognomy, peculiarity of manners, etc.); (b) physical signs.

9. Opinion.
10. Treatment.
11. After history.
12. Urine.

Cough.

- A. Subjective Phenomena.
 - (a) Character: Dry. Moist Hoarse. Spasmodic. Clanging. Brassy.
 - (b) Time of occurrence.
 - (c) Frequency.
 - (d) Provoking cause.
- B. Associated Phenomena.
 - (e) Pain.
 - (f) Dyspnoea.
 - (g) Vomiting.
- C. Objective (sputum).
 - (h) Amount.
 - (i) Color.
 - (j) Consistence.

Pain.

- A. Subjective Phenomena.
 - (a) Site and radiation.
 - (b) Character: dull, aching, sharp, lancinating, wavelike.
 - (c) How relieved or aggravated.
 - (d) Relation to effort, meals, posture, etc.
 - (e) Time of onset and duration.
- B. Associated Phenomena. (Subjective).
 - (a) Faintness.
 - (b) Giddiness.
 - (c) Others.
- (Physical examination).
 - (d) Size of area.
 - (e) Rigidity of muscles.
 - (f) Hyperalgesia: skin, subjacent tissues, muscles.
 - (g) Cutaneous reflexes.

Response to Effort.

1. Symptoms limiting effort, care being taken to elicit which symptom first arises. Breathlessness. Pain or discomfort, with situation (precordial, legs, etc.) Exhaustion. Palpitation. Giddiness. Syncope.

2. Amount of limitation, based on normal, i.e., what patient could do before illness. (a) Slightly below normal—Good. (b) Definitely circumscribed—Fair. (c) Very marked limitation—Poor. (d) No effort possible without distress—Bad. Note in each case whether response is constant, improving, variable or failing.

Vomiting.

- A. Subjective Phenomena.
 - (a) Time.
 - (b) Relation to food, drink, drugs, etc.
 - (c) Frequency.
 - (d) Character: explosive, etc.
 - (e) Amount
 - (f) Taste: sour, bitter, etc.

B. Associated Phenomena. (Subjective).

- (a) Nausea.
- (b) Faintiness.
- (c) Giddiness.
- (d) Pain.
- (e) Distension.
- (f) Headache.
- (g) Bowels.
- (Objective).
- (a) Pallor.
- (b) Jaundice.
- (c) Oedema.
- (d) Vomitus, character of, analysis of.

Headache.

A. Subjective Phenomena.

- (a) Time of onset and duration.
- (b) Locality: frontal, occipital or lateral, superficial or deep.
- (c) Mobility of head.
- (d) How relieved.
- (e) Effect of stooping, reading, etc.
- (f) Constipation.
- (g) Relation to food, effort and posture.

B. Associated Phenomena. (Subjective.)

- (a) Age.
- (b) Nausea. Giddiness. Vomiting.
- (c) Visual disturbance.
- (d) Effect of light, etc.
- (e) Air supply of environment.
- (Objective).
- (f) State of arteries and blood pressure.
- (g) Structural disease of skull, brain or membranes.
- (h) Condition of teeth, eyes, and ears; sexual organs and kidneys.

- (i) Rheumatism. Syphilis. Anemia.
- (j) Glandular swellings in neck.
- (k) Rise of temperature.

Exhaustion.

A. Sensation of Exhaustion.

- (a) Time of day felt.
- (b) Relation to effort.
- (c) Relation to meals.
- (d) Relation to posture.

B. Associated Phenomena. (Subjective).

- (a) Dizziness.
- (b) Sinking in epigastrium.
- (c) Nausea.
- (d) Faintiness.
- (e) Irritability of temper.
- (f) Mental. Memory. Concentration.
- (g) Any chilliness.
- (h) Peculiar sensations.
- (Objective).

- (a) Blood pressure.
- (b) Ocular phenomena.
- (c) Pallor or flushing.
- (d) Sweating.
- (e) Tache cerebrale.

(f) Filling of veins in neck on abdominal pressure.

Observing the arrangement of the above schedule, the records are written on plain cards to save waste of space, then enveloped and filed as usual in the alphabetical order of the patients' names. A card index of all symptoms is kept for convenience of reference. The course, susceptibilities and associations of any symptom under investigation are studied through the records of all cases presenting the same symptom and from this study deductions are to be made.

LIFE OR DEATH OF MEDICAL SOCIETIES.*

By W. E. REYNOLDS, Hopkinsville.

In all well-regulated societies of every order, the most important is self government. This not only applies to well-regulated laws and parliamentary usage, but appeals to the power of the officers, their skill, energy and ability. Law is inert without action. Too much force would be more deleterious. So the two extremes reminds me of the sayings of a dutchman I once knew. He said there was a right way and a wrong way, and a darn fool misses both. Then to harmonize our laws to the life and welfare of a society, we should select from our membership those as are able, competent and have a respective love for the order. Especially is it so that the president have these qualifications, with firmness to rule the body in a gentle, pleasant but positive manner. It is thought by some, to select the brightest and ablest physicians for president, make the most proficient. While he may give honor and credit to the profession, yet his tact of rule, may be so strict or slack, as to kill all interest in the society. He may so over-estimate the dignity of his office, as to assume the power of rule, to the aversion, scorn and contempt of the order, or again, to the other extreme. Nothing is more destructive to a society than a long-drawn out discussion, when it has whittled down to where every member is talking at once and no one listening, until precious time calls many busy members to their daily work without having received enough from the meeting to encourage another visit, while interesting papers are awaiting to be read to vacant seats or worried brethren. This is discouraging to a secretary, after having made every effort to entertain the society by selecting a man on some special subject to give life and joy to the honorable body and redound to his credit. Not only this, but when

*Read before the Christian County Medical Society.

a member has contributed his precious time, and this is no little sacrifice for a busy practitioner to prepare something interesting for so enlightened and respectable body, and many valuable ideas on scrolls of paper worthy of our most earnest consideration that may never paint the pages of history. For such to be lost, is treating both secretary and member on program with indifference and is detrimental to the society.

The secretary is the mainspring or power of a society. And it requires no little judgment and discretion as well as diligence in selecting a member and subject, to suit the occasion and season at which time this paper shall be read. To select a paper full of good, sound common sense, of original ideas, brief, with few references and destitute of as little quotations as possible, appeals to the great skill and reasoning faculties of a secretary. And here I hope you will pardon a little digression, while I cast a rosebud at the feet of our present secretary. Would leave a large bunch but his modesty forbids. I fail to have language to do him justice. But suffice to say he's a good'un.

The secretary should have control of the introduction of clinics as more than one or two patients would take up too much valuable time and become tiresome. The report of cases should come in rotation and the discussion limited, unless further time is granted by the president lest the discussion terminate in a general confab. One of the most deadly diseases to a medical society, is the bacteria conveyed by the tongue. To antedote this infection, requires prophylaxis, quarantine, fumigation and serum all scientifically used by the president.

To be president of a medical society and especially of Christian county, should fully appease the aspiration and ambition of our most worthy brethren. (And this seems to be true with a few of our ex-presidents, as they never attend the society again after their term of office expires.) But like many others who attain to office in other spheres of life, the office is often filled by favors, friendship, sympathy and self-respect, rather than proficiency. I hope this may not be construed as any reflection, as present company is always an exception. And as this paper is intended for the benefit of the society, we all may share equally our portion in reprimand, without any intentional offense to anyone.

The president should respect and protect the dignity of the office entrusted to his care by the members. And under the direction and guidance of such an officer the members have more respect for the order, interest will be enhanced and attendance will be increased and

we will have a lively, interesting and entertaining society. All lengthy, worthless discussions, contentions and discords should by no means be entertained. Financial business or wrangles would be better settled by a committee. This gives more time to instructive work and less contention and worry.

When the hour has arrived for the meeting, the president's gavel should appeal to the assembly for order and business. Nothing like promptness, one-half hour in negligence and delay, may result in one hour tardiness of the brethren. And when a member has learned that the society will do business without him, he will be more prompt in his attendance and have a greater interest in the work. And the same is true when he sees the society will wait his leisure in attendance, his delay will continue until at last he fails to make his appearance at all.

Papers would be more interesting, to be announced by the secretary at a regular stated meeting to be read before the next, as the members would have an opportunity to give some thought and study. Not more than two short papers should be entertained at one assembly, and frequently one interesting paper would be better. And as a good paper is the most entertaining and most inviting to attendance of members and encouraging to both the secretary and member who has sacrificed his time in writing a paper for the entertainment, it should be treated with strict attention and respect. The reading of all papers should never be delayed until members become tired of unnecessary wrangles and until a late hour calls busy physicians and distant members away. Like our last three or four meetings, consuming unnecessary time, deliberating on subjects better suited for members in church, or submitted to a grandjury.

In a medical society is no place to christianize a man, nor it is a court of justice. And to hammer on things not in our jurisdiction, is a waste of valuable time and leads to contention, dissensions, and unpleasant feelings, causing a friction and shock to a medical society. If a brother has violated the criminal law, then present him to a court of justice.

If a woman appeals to a doctor for aid in an abortion, and in order to encourage or stimulate him to assist her in the criminal act, she says doctor A. or B. would assist him, are we to believe she is telling the truth or telling this merely to encourage the illegal act? She may be stating facts, but a woman who goes to a doctor, and especially without her husband's presence, deliberately asks him to produce an abortion, I have very little confidence in what she might say. But I have never waited on any lady with a serious case

of septic poison from an abortion, who did not voluntarily divulge the entire crime, as if an open confession would appease her conscience and mitigate the wrong. But like the Chinaman in time of trouble, slipping his gifts into his idol god. And when the storm is over, begin to steal them back. Woman gets over her troubles and wishes to forget her narrow escape, and is inclined to protect the one who gave her trouble. So without this evidence it would be folly to attempt a prosecution, and nothing to be gained while all to lose in criticising a member in a medical society.

If a brother violates some professional obligation, it would be better to adjust the matter outside of the society; but if the gravity of the case is such as that it cannot be harmoniously disposed of, then bring it before the society, when a committee will be appointed by the president to investigate and settle if possible, as all discords handled by a society has its depressive effect more or less. Then keep clear of every thing unpleasant, if possible, and especially that not under our jurisdiction.

It is so pleasant and consoling to a clear conscience to condemn the misgivings of an unfortunate member, that we fail to stop and think what little good is being accomplished, or how much harm has been wrought in sifting a member's hidden violations.

Gentlemen, there are many good things in store for us in a well-regulated society. And while we are all equal in co-partnership, yet some may contribute more while others may receive a greater share. This we might consider a joint stock company in the science of medicine. We all have a part in it and no one so wise that he may not realize some dividends from his investment. And should he be so blest with an unusual gift of useful knowledge, he could not distinguish himself better or be remembered longer than to contribute to his needy brother. There may be some rich in practical and theoretical knowledge, who are too modest or possibly selfish to divide his rich gleanings until our secretary surveys this rich field of knowledge and turns on the electric current that brings to light hidden mysteries that possibly would be buried unrevealed with the donor. There is no physician who has faced the cold bleaks of the northwest, slashed through the mud and slush, or traced the trickling perspiration down a dust covered cheek under an oppressive radiant sun, who can't give something of interest to the society. Want of self-confidence frequently is the great barrier, and only requires the skill and influence of an energetic secretary to remove the obstruction. But if only

a little of his experience or an anecdote, would be quite refreshing and make him feel with his presence he has encouraged other members to make the society.

No member should be so selfish as to keep from the profession his presence or bright gems won through energetic work and careful practical application. If only for the social features, they should be so attractive as to influence the busy practitioner to give a few hours of his precious time each month to a fraternal greeting. Also, the member who confines himself to his cozy little den, denying himself of the happiest moments of a doctor's life, and to banish himself from the mutual benefits and associations of his professional brother, stamps him with some degree of selfishness and neglect. He should associate himself with his weaker brother, teaching him the first, last and all-important lesson, that barter and trade are degrading to all respectable and honest practitioners, and has no place in our profession, that the high standard of our calling is for the health, care and protection of suffering humanity, regardless of cost or consequences. We should be ever ready to lend a helping hand to our professional brother, either by advice or labor. We owe these treasures to our brethren, to our fellowman and to ourselves, that we may live after this body lays moldering in the clay. To our brother physician, that he may keep the good work going on and assist him in adding to our embryotic foundation, until at last a great temple is erected in the science of medicine to our honor and credit. To our fellowman, because of suffering humanity, to stay death, to relieve pain, to administer pleasure, happiness and joy, rather than sadness, sorrow and grief.

What a pleasant thought it might be to us, if after we have entered that bright celestial home, to receive a message from this old world, that our names are held in the highest esteem by brother physician for division of knowledge and for the relief we have given to our fellowman, to be handed down to generations that never knew us.

Then in conclusion, gentlemen, come make your society, remember that organization is the life of all well-regulated institutions. And without your presence we fail in organization, with a loss of social as well as instructive features and power to defend and protect not only our professional interest, but look to the welfare and interest of our fellowman, which in the near future will devolve upon the doctor to take a greater interest than ever in the passed, to take care of, and look after the health and welfare of our people, require laws directed by the doctor for the control of sani-

tation, epidemics, and diseases that are enable which are slaying millions, as well as food, habits, I might mention dress, and many other troubles deleterious to health and life, which require organization with representation in our law-making assemblies. No one knows better the good derived from this care, directed properly, than the doctor. And in our associations, we could spend precious time no more profitable than the organization against inroads to health and life of our fellowman. Every doctor should feel this great responsibility and lend his assistance to fight the mighty battle to health. Then let us be able to sustain the responsibility here required, cast in your might and receive more bountifully, that your name may live with the pages of history and your days may be remembered more profitable to the rising generation. Let your last days be your best days, and when you no longer are able to wield the scalpel or spatula, may you look back over a true, trusty and useful life, and feel that thrill of joy that fills to satisfaction a clear conscience. And when the evening shades of life have hovered well around us, and we are called upon to open our book of life and read from its pages the many kind deeds, useful and laborious work rendered and hear the declaration of those precious words, "Well done thou good and faithful servant," then, and only then, we can fully appreciate the remunerations for our laborious toils, and realize the dignity and the high-grade of our profession.

Xanthochromia of Cerebrospinal Fluid.—A case is reported by Abt and Tumpeer because of the occurrence of yellow spinal and ventricular fluid in an infant of eight months period of gestation who lived thirty-seven days and who also manifested marked internal hydrocephalus, pyelitis and bronchopneumonia. The xanthochromia of the cerebrospinal fluid was due to a meningoencephalitis, with numerous subpial hemorrhages as the source of the coloration.

Bacteriologic Examination of Blood in Infants.—This communication reports the results of puncture of the longitudinal sinus in 250 cases to obtain blood for bacteriologic examination. Bacteria were found in forty-four cases and all but three in this group terminated fatally. Nearly all of the various kinds of bacteria isolated are capable of inducing the clinical picture of alimentary intoxication, and only examination of the blood will differentiate the etiology.

THE FORUM

A CORRECTION.

To the Editor:—

I desire to make a correction in my report as Councilor of the Eighth District, as reported by the stenographer, at our last meeting, at Lexington.

I had no written report, and the stenographic report had me saying in my report on Harrison County that "The interest is not quite so good on account of the country doctors not liking the doctors in town". I said attendance of the country doctors is not quite so good on account of our meetings being held in the evening and the majority of the country members living at a considerable distance from the place of meeting. The fact is most of the country doctors live from thirteen to fifteen miles from the City, only one living within eight miles.

The feeling between the city and country doctors is the very best. I doubt if there is a county in the State where such cordial feeling exists as among the doctors in Harrison county. They have that reputation all over the State, and if this correction is not made it will necessitate my carrying a body-guard along with me.

J. E. WELLS,

Councilor of the Eighth District.

NEWS ITEMS AND COMMENTS

To prove the efficacy of our advertising pages, you might send to The Abbott Laboratories, Chicago, for a free sample of Aromatic Chlorazene Powder, (Council Passed). This Dakin antiseptic is excellent for use as a gargle, mouth wash, and spray.

Syphiloma of Vulva.—Three cases are reported by Stein. He says that the treatment under all circumstances should consist of (1) operative removal of all tumors, hypertrophied tissues and ulcers, followed in the same session by (2) energetic cauterization and combined with (3) operative removal of all tumors, hypertrophied tissues and ulcers, followed in the same session by (2) energetic cauterization and combined with (3) intensive antisymphilitic medication.

Phonendoscopy of Friction Sounds.—May refers to the extent of the area of skin from which friction sounds can be heard by auscultation in the same way as the spleen can be outlined by phonendoscopy. In his study of 300 normal and pathologic subjects he found that a very large increase in the area accompanied sclerosis of the lung, usually associated with emphysema.

Kentucky Medical Journal

PUBLISHED BI-MONTHLY BY
THE KENTUCKY MEDICAL ASSOCIATION
Incorporated

Editorial and Business Office, Cor. State and Twelfth Sts.

Entered as second class matter October 22, 1906, at the Postoffice at Bowling Green, Ky., under act of Congress, March 3, 1879.

Subscription Price\$2.00

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Next Meeting Louisville, September, 1921.

COUNTY SOCIETY REPORTS

Christian—The Christian County Medical Society met in regular session at 1:45 P. M., with the vice president, W. S. Sandbach, presiding.

Members and visitors present: W. S. Sandbach, Pembroke; F. M. Stites, Hopkinsville; Randolph Dade, Hopkinsville; J. H. Rice, Hopkinsville; J. L. Barker, Pembroke; J. G. Gaither, Hopkinsville; T. W. Perkins, Hopkinsville; W. E. Reynolds, Hopkinsville; D. H. Erkiletian, Hopkinsville; R. L. Woodard, Hopkinsville; F. M. Grace, Hopkinsville, and E. McDowell Trabue, Pembroke.

The minutes of preceding meeting read and approved.

J. H. Rice presented the application for membership in this society of F. M. Grace, Hopkinsville, with membership fee of five dollars (\$5.00), and the application was regularly referred to the Board of Censors.

F. P. Thomas, president-elect of the society, sent a letter declining the acceptance of this office, and expressing his sincere appreciation of the honor conferred by the society in his election, and assuring the society of his desire to attend and cooperate actively in all proceedings possible.

F. M. Stites made a motion which was seconded by Dr. Barker that the resignation of Dr. Thomas be accepted and that the secretary be instructed to express to Dr. Thomas, in writing the regrets of the society that he finds it impossible to accept the office. Motion carried.

F. M. Stites made a motion which was seconded by Dr. Rice, that the election of president be postponed indefinitely. Motion carried.

W. S. Sandbach being called to his office, he appointed Dr. J. L. Barker to occupy the chair in his absence.

J. H. Rice reported a case of obscure infection in an 18 day old infant, presenting evidences of inflammation in knee and elbow, which following palliative treatment was incised and drained of several ounces of pus, but did not improve, and in spite of all efforts to combat a rapidly progressing infection, died. There was at no time any evidence whatever of infection about the umbilicus, the cord having healed promptly. No site of primary infection was ever discovered.

Discussion by F. M. Stites, who was of the opinion that in spite of lack of all evidence to that effect, it was most probably an infection received about the cord either following or at the time of delivery.

F. M. Stites reported a case of latent gonorrheal infection, the initial infection occurred thirty years previously, in a negro man, 50 years of age, which produced death on the fifth day following the first acute symptoms, which first arose

in the left knee joint following a severe strain of that joint.

Randolph Dade, Rice, Gaither and Barker discussed the subject.

F. M. Stites was requested to report at the next meeting the result of laboratory investigations which have not been completed.

T. W. Perkins reported a case of sciatica treated with sodium iodide intravenously, and apparently relieved.

J. G. Gaither reported a case of Puerperal Septicaemia he is now treating with hydrargyrum bichloride, intravenously, and which is showing definite improvement.

F. M. Stites presented a most excellent paper on "The Harrison Narcotic Law", emphasizing the vast good that has been accomplished by this law, and urging hearty cooperation on the part of every physician with the Federal authorities in every phase of law enforcement. Discussed by Drs. Dade, Perkins, Gaither, Barker and Woodard.

Motion by Dr. Woodard, seconded by Dr. Stites, that the chair appoint a committee who would draft upon behalf of the society, resolutions of respect to the memory of Dr. E. C. Anderson, deceased, and cause the same to be spread upon the minutes of this society and a copy to be sent to the bereaved family, and to the press. Motion carried. Committee: Drs. F. M. Stites and R. L. Woodard.

Adjourned.

E. McDOWELL TRABUE, Secretary.

Crittenden—At the annual meeting of the Crittenden County Medical Society the following officers were elected:

T. A. Frazer, president; W. C. Davis, vice president; C. G. Moreland, secretary-treasurer; T. A. Frazer, delegate; R. L. Moore and J. R. Perry, censors.

C. G. MORELAND, Secretary.

Fleming—At the regular meeting of the Fleming County Medical Society, December 8, 1920, the following officers were elected for 1921: President, E. T. Rnryan; Vice President, W. T. Jessee; Secretary-Treasurer, Chas. W. Aitkin; Delegate to the State Medical Association, J. B. O'Bannon; Alternates, S. F. O'Brien or T. Ribelin; Board of Censors, A. S. Robertson, three years, W. S. Reeves, two years, and E. T. Rnryan, one year.

C. L. Garr reported a case of Atypical Appendicitis, operated on within forty-eight hours. Appendix was retro-cecal, ruptured with gangrenous end. Good recovery. Discussed by Drs. C. R. Garr and C. W. Aitkin.

Chas. W. Aitkin read a brief paper on Vincent's Angina, reporting an obstinate case. Dis-

cussed by Drs. J. C. S. Brice and A. S. Robertson.

There were eleven present out of a membership of fourteen.

CHAS. W. AITKIN, Secretary.

Franklin—Franklin County Medical Society met in regular session with Drs. Heilman and Coleman, January 11, 1921. J. P. Stewart, president, presided. Those present were J. P. Stewart, Roemele, Minish, Garrett, Coleman, Patterson, Heilman, Coblin, Fish and Mastin, with Drs. Taylor, Morrison and Martin, visitors.

Minutes of previous meeting read and approved.

Meeting proceeded to annual election of officers: E. C. Roemele, president; L. T. Minish, vice president; F. W. Mastin, secretary-treasurer; J. P. Stewart, delegate; Jno. Patterson, alternate; G. A. Budd, and Jno. G. South, censors.

T. L. Taylor, superintendent F. M. I., admitted to membership. Drs. Martin and Morrison made honorary members of society.

A spirited discussion arose as to the best method of arranging a program for the year. It was finally decided that the host for the monthly meeting arrange a program and select the subject for discussion, with refreshments served after meeting.

The secretary was directed to have statements printed and sent to every doctor in the county, notifying them of the time for payment of dues.

E. C. Roemele invited the society to meet with him in February. Accepted.

After the business meeting, a social session was held and refreshments served by Drs. Heilman and Coleman. A jolly good time was had by all and the two doctors were voted to be princes of entertainers.

F. W. MASTIN, Secretary.

Hickman—The Hickman County Medical Society met in the office of W. W. Richmond on Jan. 20, 1921, with the following members present: W. T. Berry, Chas. Hunt, E. B. McMorries and W. F. Peebles. The following officers were elected for the ensuing year:

E. B. McMorries, president; E. D. McCarty, vice president; W. F. Peebles, secretary-treasurer; Chas. Hunt, delegate to State meeting; W. T. Berry alternate; W. R. Moss, Chas. Hunt and W. T. Berry, board of censors.

W. F. Peebles read a paper on Diphtheria, which was discussed by all present.

The following members paid their dues: W. W. Richmond, W. T. Berry, W. R. Moss, E. B. McMorries, Chas. Hunt, T. S. Wayne and W. F. Peebles.

We hope to report all doctors in the county as members soon.

W. F. PEEBLES, Secretary.

Hardin—The regular monthly meeting of the Hardin County Medical Society was held on the above date with the following members present:

J. C. Mobley, president, presiding. J. M. English, H. R. Nusz, W. F. Alvey, F. P. Strickler, C. W. Rogers and D. E. McClure.

There was no set program. Aud, Alvey and McClure were appointed a committee to draft resolutions on the death of Dr. W. T. Pirtle.

F. P. Strickler and **J. M. English** reported several cases of diphtheria and the reports were discussed at great length by all present.

W. F. Alvey reported a case of hemorrhage following the removal of tonsils and the different methods and remedies used for the control of hemorrhage was discussed.

C. Z. Aud called attention to the fact that the Hardin County Medical Society had not failed to have a well attended meeting for more than twelve months.

After a heated discussion between Drs. Strickler and Aud as to which of them is the younger man, the society adjourned to meet February 10.

D. E. McCLURE, Secretary.

Louisville Eye and Ear Society—The annual meeting of the Louisville Eye and Ear Society was held on January 13th at the Pendennis Club.

Preliminary to the banquet a short business session was held for the election of officers. This resulted as follows: President, Walter Dean; Vice President, J. R. Peabody; Secretary-Treasurer, Gaylord C. Hall. The society then adjourned to the banquet table where covers were laid for thirty.

Walter Dean, as president of the society, presided at the banquet table and in a few well chosen remarks introduced in turn the guests of the evening. Dr. J. A. Stucky, of Lexington, president-elect of the State Society was the guest of honor. The Society desired to pay its meed of respect to Dr. Stucky as a representative of the Eye and Ear fraternity who was to lead the destinies of the State Society.

J. A. Stucky made an inspiring address in which he stressed the need of co-operative work not only among the eye and ear men but among the united profession of the State.

D. M. Griffith, of Owensboro, who was also a guest of the society, made an inspiring address in his usual masterly manner, in which he paid fitting tribute to Dr. Stucky in his labors and to the eye and ear men of the State during the early days.

Henry E. Tuley spoke to the subject of University and stressed the need of both more physicians and nurses to care for the health of the State.

J. N. McCormack also spoke to the eye and ear men regarding the administration of the

new optometry law and asked the co-operation with the State Board in enforcing this.

A number of visitors were with us. Wm. N. Offutt, of Lexington; G. F. Doyle, Winchester; H. G. Reynolds, Paducah; R. H. Cowley, Berea; S. M. Baxter, New Albany, Ind., and Dr. Hollis.

The Eye and Ear Society through this announcement wishes to call attention to the eye and ear men in the State or others who are interested in this work to the fact that they hold meetings the second Thursday in each month, except July and August, in a room in the administration building of the City Hospital. Meetings begin at eight o'clock and there is always a program. Meetings are well attended and instructive. The society extends a cordial invitation to all interested in this work to meet with them and to take part in the discussions.

A hope was expressed at the annual meeting by Dr. Stucky and others that this society might form a basis of a State Eye and Ear Society that could be organized and have a meeting one day in advance of the State Medical Society. It is the intention of some of the members to try to organize such an association and the Secretary would like to have expressions of opinion of the men throughout the State regarding its feasibility and whether they would be willing to give it support.

The following is the program for the year as adopted by the society:

PROGRAM FOR 1921.

February—Dacryocystitis—Treatment, by Dr. Lederman.

March—Vertigo and Ear Diseases, by Dr. Watkins.

April—Corneal Ulcer—Treatment, by Dr. Wolfe.

May—Relation of Nose and Throat to Ear Diseases, by Dr. Peabody.

June—Case Reports. Each of the following members to report one case: Drs. Bass, Baker, Dabney, Hall, Hester, Hays, Leach.

July and August—No meeting.

September—Relation of Nose and Throat to Eye Diseases, by Dr. Funk.

October—Prevention and Treatment of Operative Hemorrhages in Nose and Throat Work, by Dr. Dean.

November—Concomitant Squint—Treatment, by Dr. Pfingst.

December—Case reports. Each of the following members to report one case: Drs. Pirkey, Robertson, Simpson, Shafer, Wynn, Wright, Maupin, White, Ritter.

GAYLORD C. HALL, Secretary.

McCracken—I desire to report a medical meeting of the McCracken County Medical Society on

January 12th, as they have again inveigled me into the position of Secretary.

At our last meeting of December 12th, L. P. Molloy was elected president; O. R. Kidd, vice president; Vernon Blythe, secretary; E. W. Jackson, delegate; J. N. Bailey, alternate; P. H. Stewart, treasurer; C. E. Purcell, censor.

At our meeting of January 12, 1921, the first of the new year, there were present the following doctors: Molloy, C. E. Kidd, Pulliam, Stewart, W. P. Sights, Duley, Jackson, Shemwell, Jones, Blythe, Linn, Bailey, Harkey Willingham.

After the report of some committees, we got down to a real interesting meeting of a scientific character value.

H. H. Duley read a paper, "The Different Anesthetics and Their Relative Value."

There was a free discussion upon this paper. There was some difference of opinion concerning the value of the different modes and also a question arose concerning the danger of the use of ethyl chloride as a general anesthetic. The use of morphine and atropine was also favored by some and condemned by others.

The paper was well received and developed a subject which should be of the greatest interest to every physician for it is of the greatest importance to humanity.

E. R. Goodloe then read a paper upon "Pneumonia."

This very important subject was gone into with great thoroughness. The essayist gave to the society a very splendid paper and the benefit of his experience in the handling of pneumonia. The members present appreciated the paper very much and their interest was evidenced by the free discussion which it brought forth. Space will not permit a summary of the papers nor of the discussion, but the meeting was most probably of considerable profit to all who attended. We hope this year to have a splendid scientific program at each meeting and will be glad to have all and any of our doctor friends to visit us who may come our way upon the second and fourth Wednesday nights of each month at the Board of Trade rooms, City National Bank, Paducah.

VERNON BLYTHE, Secretary.

Montgomery—At the regular meeting of the Montgomery County Medical Society, the following officers were elected: O. P. Henry, president; C. K. McKenna, vice president; J. F. Knox, secretary-treasurer; J. F. Jones, delegate; D. H. Bush, alternate; J. F. Reynolds, J. F. Lockhart, P. K. McKenna, censors.

J. F. KNOX, Secretary.

Russell—The thirty-second annual session of the Russell County Medical Society was held at the Holt Hotel, Jamestown, December 29, 1920, at 10 a. m. The following officers were elected for 1921: J. B. Tartar, Russell Springs, Presi-

dent; W. G. D. Flanagan, Jamestown, Vice President; J. S. Rowe, Ono, Censor for two years; L. D. Hammond, Irvin Store, Censor for three years; J. B. Scholl, Delegate for two years, J. B. Tartar, Alternate for two years; J. B. Scholl, Jabez, was elected Secretary-Treasurer for the 28th term.

Members present or by proxy, and paying dues: W. L. D. Hammond, A. V. Neathery, J. B. Tartar, W. G. D. Flanagan, J. B. Scholl. The other members will send in their dues as sickness and etc., prevented them from being present. There was frost upon the pumpkin and fodder in the shock. The above doctors were at the meeting in a flock, in the mud up to their hocks.

J. B. SCHOLL, Secretary.

Simpson—The Simpson County Medical Society had an excellent meeting December 27th at which officers were named for 1921, and a friendly discussion as to the purpose and aims of the society throughout the coming year was contributed to by all present. At the conclusion of the business session, an elaborate luncheon was served by Dr. W. A. Guthrie at the Southern Kentucky Sanatorium. Dr. Guthrie also solved, what has been a vexatious problem, that of a suitable meeting place for the society, by tendering the free use of a large and splendidly equipped room for its meetings, same being thankfully and unanimously accepted by the society. This will be a great help. Everything considered, we are predicting that 1921 will be our best year.

Also take this means of applying for a charter (Article VII, Constitution and By-Laws for County Societies) for the Simpson County Medical Society. If we ever had one, I find no trace of it now.

The following members were present: W. A. Guthrie, C. L. Venable, S. B. Hinton, J. R. Claypool, E. K. Lamb, Young Pepper, N. C. Witt.

N. C. WITT, Secretary.

Wayne—At the regular meeting of the Wayne County Medical Society the following officers were elected: O. M. Carter, President; C. B. Rankin, Vice President; J. F. Young Secretary; T. H. Gamblin, Treasurer; Percy Parrign, Delegate.

J. F. YOUNG, Secretary.

Wayne—At the regular meeting of the Wayne County Medical Society, the following officers were elected:

O. M. Carter, president; C. B. Rankin, vice president; J. F. Young, secretary; C. B. Rankin, treasurer; Perry Parrign, censor.

J. F. YOUNG, Secretary.

KENTUCKY MEDICAL JOURNAL

BEING THE JOURNAL OF THE KENTUCKY STATE MEDICAL ASSOCIATION

Published Under the Auspices of the Council

VOL. XIX. 

BOWLING GREEN, KY., MARCH, 1921

No. 3

ANNUAL DUES.

This will be the last number of the JOURNAL that will reach you unless you have paid your annual dues to your county secretary. The next few issues of the JOURNAL will be large ones and will be full of interesting matter. You cannot afford to miss a single one of them. Besides, you cannot be defended for an unjust suit for malpractice unless your dues are paid. For these reasons we urge every one to send or hand your county secretary the money or check as soon as you read this editorial.

The annual meeting of the State Association will be held this year in Louisville beginning September 27th. The committee on scientific work consists of Dr. J. A. Stucky, President-Elect, Lexington, Ky., Dr. Owsley Grant, Louisville, Ky., and the Secretary. Either of them will be glad to have suggestions from members. This will doubtless be the largest, and it is of importance that we make it the best, meeting the Association has ever held. The Council has instructed the JOURNAL to announce that Dr. Stuart McGuire, of Richmond, Va., will deliver the annual address. Dr. McGuire is the son of the great Surgeon General of the Confederacy, and is himself one of the great surgeons and great men of the country. He is a thoughtful student of medical affairs and one of our greater orators. The announcement of his name will mean that no Kentucky physician can afford to be absent from the September meeting. We hope to publish the entire scientific program in the next issue.

IMPORTANCE OF TYPING PNEUMONIA AS GUIDE IN TREATMENT.

The profession of the State will be much interested in the announcement by the State Bacteriological Laboratory at Louisville that Dr. South is now prepared to report to physicians which of the four types of pneumonia is shown in any specimen of sputum in this

disease sent in for examination. The advantage of knowing the type of the disease is obvious. This is highly important because one type of pneumonia can be treated advantageously with its specific serum, while in other types such treatment is of little value.

The JOURNAL urges every physician to send in specimens so that it can know just what types of pneumonia are occurring in Kentucky, in order that the matter of specific treatment can be considered advisedly.

Recent investigations by Cole, Avery, Chickering, Dochez and others of the Hospital of the Rockefeller Institute, seem to give positive information concerning both diagnosis and treatment. The pneumococcus, they find, falls into four main groups, or "types," each type having specific immunologic characteristics. Thus serum produced by the injection into a horse of Type I pneumococci will agglutinate organisms only within its own group and has protective value only against this form of the disease.

In a study of 454 cases the incidence of the various types and resulting mortality were found as follows:

	Incident per cent	Mortality per cent
Type I	33	25
Type II	31	32
Type III	13	50
Type IV	20	16

One-third of all pneumonia cases are therefore caused by Type I pneumococci.

Type III, fortunately the inciting organism in the smallest percentage of cases, possesses the greatest virulence, with a mortality of 50 per cent. Type IV, causes the relatively mild cases with the lowest mortality, approximately 10 per cent, and is the organism found normally in the mouth.

In Type I antipneumococci serum prepared by the injection of its own type of pneumococci into horses, is highly effective in its treatment, and by this method the mortality has been reduced from 30 per cent to approxi-

mately 8 per cent, and thus far seems to be the only serum with a curative value.

In the other types their respective serums have so far proved of little value.

In collecting specimens to be sent to the Laboratory, care should be taken that sputum coughed up from the deeper air passages should be sent and not saliva from the mouth. A specimen from each member of the family, or those in contact with patient is desired, as it is now known that pneumonia is a contagious disease and the virulent types of pneumococci are often found in the nose, throat and mouth of healthy contacts and convalescents, and no patient should be allowed to mingle with the public until it is definitely known by laboratory analysis that pneumococci are no longer present.

This is a new line of work for the Laboratory and a new effort to lessen both the incidence and the death rate of this disease, which exact a toll of an average of 2528 Kentuckians each year.

SMALLPOX AGAIN EPIDEMIC.

Smallpox is again reported as epidemic in almost every section of the State. As usual, a few physicians with sleeping sickness are making mistakes in diagnosis, calling the early cases chickenpox and other diseases, and in this way the disease gets its start in new localities. It is important that not only health officers but family physicians urge their people to be vaccinated. The law requires it and every law-abiding citizen is vaccinated. More than this, common sense requires it and every intelligent citizen is vaccinated. If this can be made clear to your patients you should have no difficulty in freeing them from this miserable disease.

SCIENTIFIC EDITORIALS

TRACHOMA AGAIN.

Everyone who has had much to do with trachoma admits the following facts.

First, late cases of trachoma are very difficult to cure.

Second, early cases are easy to cure.

Third, in its early stages it is exceedingly difficult to tell trachoma from simple chronic conjunctivitis. In fact, it can be said without fear of contradiction that it is often impossible. We find in the same family some cases which are undoubtedly trachoma conjunctivitis. We find in the same person one eye which is frankly trachomatous and the other looking like simple chronic conjunctivitis. We see a case this year and treat it for chronic conjunctivitis and next year the

same person comes in with a frank trachoma. When such difficulty obtains as to diagnosis it is the part of wisdom to treat a suspicious case as trachoma and take no chances.

The only satisfactory treatment is operation. In the early stages the conjunctiva can be stripped clean with forceps, rubbed with a tooth brush dipped in a 1-1000 bichloride solution and wiped with gauze after the method of Dr. McMullin and the cure is almost certain. It should be done under general anesthesia. For 24 hours after the operation ice pads should be kept constantly on the closed lids. In a couple of days the lids may be everted and touched with 2 per cent nitrate of silver once a day for about a week. At the end of two weeks the eyes will be well in a majority of cases. Late cases are operated in exactly the same way only more thoroughly if possible. The cure in these late cases is much less satisfactory and sometimes impossible.

The general practitioner should be suspicious of all cases of conjunctivitis in families where there is trachoma and also of all cases where on everting the lid the edge of the cartilage is covered with a thick, rough mucous membrane which entirely obscures the blood vessels. If these simple cases do not clear up after a month's treatment they should be operated on suspicion. The operation is simple, practically devoid of danger and will save the patient months of troublesome treatment even if a positive diagnosis of trachoma cannot be made. The more of these cases one operates the more convinced he becomes that it is a pity to condemn such a patient to months of troublesome treatment when a complete cure can be obtained so easily.

R. H. COWLEY.

SYPHILIS AND THE CENTRAL NERVOUS SYSTEM.

IV.

SPIROCHETES AND NEURO-SYPHILIS

Is there a special spirochete with a predilection for the central nervous system and causative of special organic lesions of brain and cord, or to put same in a little more technical manner, is there a long, thin spirochete possessing especial organo-trophic action upon a spinal cord and cerebrum? This is a rather difficult question to answer for one must remember the other side of this many faceted proposition—syphilis—that the individual infected with syphilis may have a connate, developmental or hereditary predisposition in the shape of inherently weak tissues, so that any form of spirochete may be

capable of specifically influencing these tissues. Those of us who practiced in "the good old days" before Schandinn, Wassermann and Bordet, furnished us with micro-organism and seral test, will recall the interesting clinical data that we accumulated from certain types of neuro-syphilis, to the effect that these cases often, in fact nearly always gave, the history of a simple, discreet sore, very mild or practically no secundines, with a later development of many neural manifestations. As late as a year ago Van de Valk enters a note of warning, of extreme caution with regard to the so-called "abortive" cures of syphilis by "intensive treatment." This would seem to coincide with the experience of Taylor, Bumstead, the elder Palmer, of our City and the position taken by his son. We all recall and remember the experience of Fournier I, (and no keener syphilographer lived), who observed that nearly all those men who had cohabited with a certain *femme du pave*, and acquired syphilis suffered as did the girl from its neural manifestations, especially paresis and tabes. Nor must we forget Brosius' seven glass blowers infected in their work with labial chancres, from the same source, five of whom developed tabes and two general paralysis of the insane, nor Morel Lavallee's five men infected from the same woman, one of whom developed syphilitic meningitis, two paresis and one syphilitic psychosis. And one escaped of the known five. And how many others in all these instances escaped neural syphilis, no one will know. And still another interesting fact. Cases suffering from syphilitic toxemia of the brain and nerves, and from gummatous lesions, appear to be exempt from paresis and tabes. It has been my fortune or misfortune, to see many, many cases of syphilis of the nervous system, of all varieties, in all stages and from this experience I am willing to formulate the following:

That the seemingly *mild and benign* cases are the ones most likely to develop the organic lesions of brain and cord. I unqualifiedly subscribe to the statement that those cases that have seemingly been very severe, do not as a rule have lesions of the central nervous system. By severe (I prefer this to the abused term "malignant") I mean with marked cutaneous, lymphatic and general systemic involvement. Here again other factors must be considered. We may say with all truth that a very mild infection does not impress, shall we say "scare", the patient, and as a result he feels it amounts to little. The ready healing of the sore, the slight systemic involvement may even leave him (or her) under the impression that perhaps after all there has been no syphilis, hence, no need for patient

persistent and never ending treatment. *Per contra* with the man who has a severe sore, alopecia, lingual and pharyngeal ulcers, marked cutaneous eruption, et al, who sees and knows he has had a severe infection, feels he must take full and careful treatment. But even with full and careful treatment of the mild cases, by men really competent, through knowledge and experience, these quaternary manifestations may develop. We must realize that in a certain sense these severe cases are in their misfortune, more or less lucky, for my experience teaches me that recurrences of spirochetic activity may be and generally are along lines of these primary manifestations. Misfortune even has its grades and its levels. But another phase must be here considered. Are these cases free from neural and more less destructive changes because in the original attack there has been developed more or less active and potent anti-bodies? Is this the reason why the negro is immune or practically immune from tabes and paresis? And it must be remembered that anti-bodies can pass through the choroidal membrane and enter the cerebro-spinal fluid, hence acting as immunizers for the tissues of the central nervous system. Many have syphilis; many have neuro-syphilis. And why, should this form lie dormant so long in some cases; why appear early in others? Perhaps some lessons drawn from the world war will help us to answer these questions. We might briefly epitomize the answer by saying that this great war has shown only too plainly that many nervous systems, after exhaustive and careful examinations, appearing to be normal, react severely in the presence of trauma, infectious diseases, strain, physical and mental and especially to emotional stress. Some nervous systems seem to react to the spirochete with unusual rapidity and some do not seem to react at all. But it seems axiomatic to me that resistance, an inherent quality and variable in each organism, can and is lowered by the various influences above mentioned. We all know and have seen the terrible results following influenza, both neurally and physically, and can readily understand that a central nervous system, normally resistant to the toxemia or actual presence of spirochetes will under trauma, infection and emotional stress be so lowered as to make possible a renewed activity of this micro-organism. So I would be inclined to state the proposition as follows: that we may, and probably do, have a spirochete that is neuro-trophic; that neuro tropic activity will depend upon the factors of hereditary weakness, developmental defects and excitants whose action depresses neural resistance.

OFFICIAL ANNOUNCEMENTS

KENTUCKY'S NEW DRUGLESS PRACTICE LAW.

1. That the State Board of Health shall, upon application of the Kentucky Association of Optometrists, in regard to the practice of optometry, and of any state association composed of practitioners of any drugless or limited school or system diagnosing or treating human ailments, defects or deformities, now in existence or which may hereafter be devised, legally chartered under the laws of this commonwealth, from a list of seven of its members selected and certified to said board by such association as persons of good moral character and graduates of a reputable college of such system of practice, appoint three assistant examiners for each such school or system to represent each of said groups in the examination of its applicants by preparing all questions and grading all papers involving methods or principles of diagnosis, treatment, adjustment, cure or relief of patients and by the assistant examiners in optometry in the practice of optometry, and who may be present at any meeting when such grades are considered, which grades shall be accepted by the board and considered with the grades made in anatomy, physiology and pathology prescribed and required by the board to test the qualifications of applicants from all schools or systems to practice with safety to the sick and afflicted and the board shall issue certificates to all applicants who make the grades required by existing law, provided that applicants may practice the branches in which they are found qualified. The board shall have authority to hold separate examinations for the different schools, or systems of practice, or groups of them or for optometrists, as it may deem best, and may, insofar as in its judgment may be consistent with the safety of the sick and afflicted, limit the examination to anatomy, physiology, pathology and other subjects to special regions or parts of the body, and in its certificates it shall limit the treatment and work of such applicants to the method of practice in which they have been trained and found qualified. All examinations shall be secret and in all matters as to standards of education or reputation and as to questions and grades shall be governed and conducted as provided by law and by rules and regulations of the board not inconsistent therewith.

2. That applicants may present their credentials by mail or proxy upon forms furnished by the board. All certificates shall be signed by the president and secretary and

attested by the seal of the board. The fee for each certificate, including the examination, shall not exceed the sum of twenty-five dollars, which is hereby fixed as the fee to be paid by all applicants, and all of such fees shall be paid into the state treasury and kept as a separate fund and used for paying the expenses of the administration and enforcement of this act and of chapter 85, Kentucky Statutes, and shall be accounted for as required by law for other funds and expenses of the board.

3. That any person who was reputably engaged in the practice of anesthesia, chiropractic, chiropody or other systems of drugless healing or optometry, or any other limited system or special branch of practice in this commonwealth on or before January 1, 1920, who is endorsed as competent and reputable by the assistant examiners for the school or system which he professes to practice, or in respect to an optometrist by the assistant examiners in optometry, and who makes application to the board within ninety days after this Act goes into effect, accompanied by the fee shall receive a certificate without examination. All certificates, issued under the provision of law by the State Board of Health when registered in the office of the county clerk of the county in which the holder of such certificates resides, shall authorize the holder to practice the system of healing named in such certificate, subject to all of the conditions imposed upon the holders of all certificates heretofore issued, or hereafter to be issued under the law.

4. That any person living in this state or who may hereafter come into this state who administers anesthetics or practices or attempts to practice any system of diagnosis or healing now in existence or which may hereafter be devised, or who corrects defects of the eye or other parts of the human body by mechanical or any other means, except upon the prescription of a legally qualified physician, or in any way performs the duties usually performed by physicians, without having complied with the provisions of law, or who opens an office for such purpose or announces to the public a readiness to so practice, shall upon conviction, be subject to all of the penalties provided in section 2618, chapter 85, of the Kentucky Statutes; provided this Act shall not apply to persons who sell trusses, spectacles, eyeglasses, or lenses only as merchandise in duly established mercantile establishment; provided further, that this Act shall not apply to the practice of Christian Science; provided further, that this Act shall not apply to the practice of dentistry.

Approved March 20, 1920.

OATH AND RULES AND REGULATIONS MADE UNDER
THE LAW

For all announcements or claims to the public by means of cards, circulars, advertisements or otherwise, unanimously recommended respectively by the Assistant Examiners of the systems of practice named and approved by the State Board of Health.

8. I was a bona fide resident and practitioner of in this State on and prior to January 1, 1920, and in making this application I agree to conform to the honorable rules of conduct and fair dealing with the sick and afflicted always required of, and observed by all practitioners of healing, regular, homeopathic, eclectic, osteopathic and others, as a condition of obtaining and holding certificates to practice in this State, and I pledge my solemn word of honor that I will not make or join with others in making any announcements or claims to the public which have not been submitted to the State Board of Health by the Assistant Examiners provided by law for my school or system of practice, with its recommendations, and officially approved by said Board.

I enclose \$25.00, the fee fixed by law.

Signed
(Full name of applicant.)

Postoffice

County

Subscribed and sworn to before me by

(Full name of applicant.)

this day of, 19....

Rule 1. For Chiropractors

DR. JOHN DOE, Chiropractor.

Norton Building, Louisville, Ky.

Room 364.

Hours: 9 a. m. to 5 p. m.

Phones: City or Main, 1839.

Practice limited to the treatment of disease by spinal adjustment.

Rule 2. For Chiropodists

JOHN DOE, Chiropodist.

Trnst Co. Bldg Lexington, Ky.

Rooms 506-507

Hours: 8 a. m. to 6 p. m.

Practice limited to the treatment of corns, bunions and other minor surgery for foot troubles

Rule 3. For Anesthetists

MISS MARY DOE, Anesthetist.

Frances Building Louisville, Ky.

Room 405

Hours: 11-12 a. m., 1-2 p. m.

Phones: City or Main, 2458

Practice limited to the administration of anesthetics.

Rule 4. For Optometrists

JOHN DOE, Optometrist.

Starks Building, Louisville, Ky.

Room 419

Hours: 9-12 a. m., to 2-4 p. m.

Phones: Main or City, 4196.

Practice limited to diagnosing and correcting defects of eyesight by the fitting of proper glasses.

Rule 5—Form of cards or other announcements recommended for optical houses or companies conducted by or employing practitioners holding certificates.

The Western Optical Company,

Francis Building, Louisville, Ky.

Phones: Main or City, 2525

A full line of the best spectacles, eyeglasses and other optical goods and supplies. Constant optometric service. Oculists' prescriptions and mail orders given prompt attention.

Rule 6—Announcements or advertisements other than the above forms must be submitted to and recommended by the Assistant Examiners for any of these systems of practice, and approved by the State Board of Health.

Rule 7—Except in sparsely settled counties selected by the Assistant Examiners of the system of practice to which he belongs and the State Board of Health, and by practitioners specially designated by these authorities in writing for a definite period, nothing in the law shall be construed to authorize any one holding a certificate under this law to register or practice as an itinerant or to use solicitors for his practice in any part of this Commonwealth.

Announcement Under the Medical Law

As a matter of interest and information for all concerned the forms of announcements recommended under former laws follow:

Rule 1—For Regulars, Homeopathic and Eclectic.

Dr. John Doe Francis Building
Louisville, Ky.

Hours: 11 a. m. to 1 p. m.

Phones: Main or City, 2525

Practice limited to internal medicine or to surgery or other specialty as may be.

Rule 2—For Osteopaths

DR. JOHN DOE, Osteopath.

425 E. Chestnut St., Louisville, Ky.

Hours: 9 a. m. to 4 p. m.

Phones: Main or City, 434

Practice limited to the treatment of disease by adjustment of the spine or other misplaced structures

In connection with the foregoing the following will be interesting as a further illustration of the spirit in which all of its work is being conducted.

TO KENTUCKY OPTOMETRISTS, LOUISVILLE.

Greetings:—

Enclosed you will find copy of the State law passed at the last meeting of the General Assembly governing the practice of Optometry in this state, together with definitions and rules for Optometrists and other systems of practice recommended by the Boards of Assistant Examiners and approved by the State Board of Health.

We would like also to call you attention to the following quotation from "Foundations of Sociology," by Professor Ellis of the University of Wisconsin, commended to this Board by Mr. R. C. Augustine, President of the American Optometric Association.

ABHORANCE OF ADVERTISING

Soliciting employment, advertising, seeking publicity, underbidding, attempts to supplant or to injure maliciously the reputation or prospects of a colleague, are frowned upon as tending to lower the profession to the level of a trade.

Lawyers ban advertising as tending to stir up litigation. There is, furthermore, the consideration that competitive advertising would greatly augment the expenses of professional men, without making them in any way more useful to the public. The psychology, however, underlying the aversion to advertising in all professions is, doubtless, the fear lest competition degenerate into an undignified scramble for business by all manner of self-laudation, falsehood, and depreciation of rivals. In a profession, pride is too strong to stomach the situation which would result if the members flung themselves upon a chance for employment with abandon of news-boys or street porters seeking employment.

In barring out any other means of commending one's self to possible patrons than worthy service, paid or unpaid, public or pri-

vate, professional men are protecting not only their own interests, but that of society as well.

Respectfully yours,
Board of Assistant Examiners in Optometry,
R. U. KENDALL, Chairman.

ORIGINAL ARTICLES.

EPIDERMOPHYTON INFECTION.*

By HENRY H. KOEHLER, Louisville.

From the eczema scrap-heap, a veritable dumping ground in the past, another waif has been rescued and given a local habitation and a name. It seems that many cases of so-called vesicular eczema, of dysidrosis and porapholix, eczema, moriginaturn, interdigital keratosis and axillary ringworm, are all interwoven in one common intricate meshwork, having as their one causative agent the epidermophyton inguinale.

We owe this clarifying of an obscure field and the establishing of this fungus as the proven infective agent to the researches of Sabau-roud, of Paris, but only lately have clinical cases been published in this country confirming his findings. It was my fortune to see a large number of ringworm cases at Camp Taylor during the spring and summer of 1919 and many of these finally on closer investigation proved to be of this particular type of epidermal infection.

Professor J. C. White, of Harvard, in the August 1919, number of the Journal of Cutaneous Diseases, reviews this subject exhaustively, showing its ubiquitous character and wide distribution under divers masquerading costumes. This disease, as expressed by Pusey in the discussion of the paper by Ormsby and Mitchell, in 1916, is undoubtedly very common and equally undoubtedly seldom recognized; to which I will add that its existence is practically unknown to the general practitioner.

The disease may manifest itself on any part of the body, though it has its sites of predilection. It is generally agreed now, its wide scope having been revealed, that the inguinal region is not the one most frequently involved, and the term inguinal not properly chosen. It occurs primarily on the body, buttocks, thighs, back and arms as red or brownish slightly scaling patches, rapidly extending with well-marked lines of demarkation. This picture is greatly modified, however, on other parts, assuming a more or less macerated, sodden condition on those where coaptation of surface occurs, such as the anal fold,

*Read before the Jefferson County Medical Society.

about the scrotum, umbilicus, axilla, and between the toes. It is in the last region that it persists with greatest obstinacy and is really what is usually classed as dysidrosis and pompholyx, frequently becoming the site of a secondary infection and leading to painful fissures, and after exfoliation leaving a raw glazed, tender surface with tendency to bleeding.

Occurring most frequently between the smaller toes, it is an exceedingly common picture and familiar to everyone. Spreading to the soles it shows itself in yellowish thickened areas of the skin with painful fissuring and most obstinate in its resistance to treatment. It can be well maintained that the disease entity known as pompholyx has been disestablished and its parasitic nature revealed. As the name indicates, it is an epidermal condition, the infection does not extend deeply, there is no follicular invasion unless it is a mixed one, and there is no involvement of the hair shaft.

The subjective symptoms are variable, hardly noticeable in many cases, yet in others producing an almost intolerable pruritus with ensuing loss of sleep and nervousness, most frequently in crural and scrotal involvement. Being spread by contact marital transmission readily occurs, and grave suspicions are unnecessarily aroused. Relapses are common; I found this almost to be the rule; also reinfection if living conditions remain the same. Its invasion of a gymnasium or army barracks is almost like an epidemic at times, being spread by towels, rubber sponges and contaminated toilets. It is undoubtedly the ringworm type hitherto called "dhobie itch" of the Philippines. The term referring to its spread by laundry and clothing. Many cases can be traced to suspensories, producing the old familiar eczema marginatum.

When so an experienced observer as Professor White says that his knowledge of this infection of the skin dates backward but little more than a year, it is certainly not to be wondered at that the condition is practically an unrecognized one. I regret exceedingly that prevailing facilities at Camp Taylor did not permit of exact and painstaking bacteriologic examinations. The demonstration of the fungus is not an easy matter and its cultivation still less easy. In a recent personal communication from Dr. Ormsby, of Chicago, one of the pioneer investigators, this fact is dwelt upon; that only such laboratory workers can be depended on for this work who have had an intimate training, as one might say, "from headquarters." It requires an infinite amount of patience and persistence. It is thus apparent that many obstinate patches of so-called eczema have a mycelial basis

and only toward destruction of the causative agency can we look for relief.

Ringworm to the general practitioner and to the laity is a simple thing, but to the dermatologist it has become one of ever-increasing interest and complexity. Not only have we the well-established large and small spored varieties of the trichophyton fungus with its differing powers of hair shaft invasion, but there come further the various types of animal origin, the dog, cat, horse and bird. A deep-seated angry type I have frequently seen derived from horses, a kind looked upon as a vesicular or squamous eczema, and only yielding to the most energetic anti-parasitic treatment. In children a widely disseminated variety occurs acquired from the cat, appearing in a multitude of small slightly scaling patches and readily cured by sulphur applications. All such varieties, however, are to be differentiated from the one under discussion, which may appear both as an acute rapidly spreading infection, or as essentially a chronic stubborn condition becoming such an established factor in the patient that he ceases to seek treatment. White reports such a case of eighteen years' duration, and if we consider the complacency with which the so-called interdigital eczemas are endured, this is not to be wondered at. I know of several cases of transmission from husband to wife—an invasion of the vulva from the old chafe of the husband—another contributing factor to marital infelicity!

It is very probable that cases of pruritus are notoriously rebellious to treatment belong in this category, as do also hitherto obscure affections of the nails. Infection may readily take place from scratching. It has been the experience of most investigators that lesions are apt to undergo marked betterment, even disappearance, during winter, only to reappear the following summer.

Regarding treatment: It is pleasing to state that this infection is an entirely curable one. There can be no reason for undue persistence if correctly diagnosed with proper treatment following, and that is always an energetically anti-parasitic one. Mild, soothing measures, such as are adapted for intertrigo or other similar affections, are of no avail here. Even if the case presents the picture of an angry dermatitis nothing is gained by delaying the one active procedure, and that is the killing of the fungus and its spores. Indeed the more inflamed and acute the lesion is the more readily is this brought about. No hesitancy need be felt regarding the location of the lesion either, such as the scrotum, crural and axillary regions. It is to be remembered that proper treatment, excepting perhaps on some old thickened sites,

is rapidly effective and any slight additional irritation becomes negligible.

By far the best application in my experience has been chrysarobin in a rather thin gutta-percha-chloroform solution. This is a remedy, however, that must always remain in the physician's own hands and its effect watched by him. Some individuals show a quick reaction toward this drug, inducing a dermatitis of its own after one or two applications, when it should of course be discontinued. As it seems to exert its curative effect indirectly by substituting an anti-parasitic reaction of the skin, such an early and quick result is quite desirable. Additional treatment in moist regions consists in subsequent thorough dusting with some indifferent powder.

The patient must never be allowed to indulge in any reckless self-treatment. Personal inspection should be made every few days and conditions met as they arise. Healed patches present, as is usual with chrysarobin treatment, a well-defined decolored area sharply outlined, showing that a cure has been obtained and no further treatment necessary.

Other valuable agents are salicylic acid, ammoniated mercury and iodine. Where thickened chronic lesions prevail salicylic acid is invaluable on account of the loosening effect it exerts on a hyper-keratosis, and it may be incorporated if needed in the chrysarobin varnish. The official ointment of ammoniated mercury, either alone or reinforced by salicylic acid, acts well and is perhaps the best for infections about the female genitalia. A very disconcerting picture is sometimes presented here, the original trouble becoming further infected through scratching and contaminating discharges. Such rebellious cases often simply classified as pruritus, should always be considered in the light of a possible epidermophyton invasion and an energetic course of treatment instituted, perhaps requiring bed rest for complete relief.

Bory's ointment consisting of iodine, xylol and vaseline comes highly recommended and is well worth trying. I will say, however, that the tincture of iodine has been distinctly disappointing under my observation. It is frequently applied as the most convenient first aid, but its employment is unjustified where other agents can be used.

White particularly mentions Whitfield's ointment in the treatment of this affection and extols its virtues highly. It has not received universal acclaim, however, but is certainly well worth trying in selected cases. It is a salicylic and benzoic acid mixture in benzoated lard.

Epidermophyton infection is only new in so far that its exact status has but lately been

fixed. It has a peculiar complexity in manifesting itself and is the basis of many obstinate dermatological lesions hitherto variously classified and correspondingly improperly treated. Many unyielding, puzzling cases that come under the observation of the general practitioner parading as intertrigo, eczema, psoriasis, pruritus, or the laity's favorite "tetter" are undoubtedly due to this masquerading fungus, and will only yield after all patience has been exhausted by treating them "judiciously rough."

DISCUSSION:

W. B. Gossett: In military practice I saw a great many patients with epidermophyton infection of the skin such as described by Dr. Koehler, and our routine treatment was to paint the involved area with potassium permanganate solution. In making the solution we did not even measure the quantity of the drug, we merely made a solution which was dark red in color and applied this to the skin every morning. Eminently satisfactory results were secured by this method of treatment.

H. H. Koehler (closing): Potassium permanganate, being an active anti-parasiticide, may be efficacious in the treatment of epidermophyton infection; but has the serious objection of obscuring the appearance of the involved area making it impossible to determine whether any progress is being made toward recovery.

Bichloride of mercury, alcohol, and various other agents are effective where the fungus described is the cause of the disease. Any treatment applied to be curative must be anti-parasitic.

LATE POST-OPERATIVE OBSTRUCTION-ENTEROSTOMY UNDER LOCAL ANESTHESIA*

By W. I. HUME, Louisville.

In view of the importance of this subject the paucity of literature dealing directly with it is surprising. It is well known that a considerable percentage of the mortality following intra-abdominal surgery is due to this cause. This is true in spite of the fact that the causes are well known and preventive measures have been carefully worked out. The type of operation done, the technique employed and the skill and judgment of the operator, of course, count heavily in the production of prevention of conditions favorable to the occurrence of obstruction. The fact remains, however, that this serious sequel follows work from the hands of our best operators. Beckman in a report of two such cases (Journal-Lancet, Aug., 1917) remarks that

*Read before the Jefferson County Medical Society.

"so long as surgical operations are done as they are at present just so long may we expect this distressing complication." That is a true statement and it implies a warning to each operator to be ready to interpret the symptoms and to apply effective treatment if such is to be had.

Causes of this condition, as remarked above are generally well understood and will not be discussed in this paper further than to call attention to one seldom mentioned, i. e., drastic cathartics or rather cathartics too drastic for a given patient. The Year Book (Gynecology) edited by Dudley and De Lee states that the unwise administration of cathartics after abdominal operations may precipitate obstruction. The case herewith reported illustrates, to the writer, the truth of this statement. The routine use, sometimes observed, of a set dose of a favorite laxative is to be condemned.

Positive early diagnosis of post-operative obstruction is not always easy. Conditions resembling obstruction may occur from reflex causes, e. g., from acute renal disease (C. H. Mayo-Annals Surg. 1917-LXVI). Errors in diet, which are occasionally committed in spite of routine care, may lead to considerable distention, some vomiting and distress; in such cases it may be that a proper bowel movement is had only after rather drastic measures are employed. Acute dilatation of the stomach has been reported as late as the seventh, even the tenth day; these cases must be differentiated from high obstruction particularly. Then symptoms vary with location of the obstruction. There may be great distention or none; all symptoms may come on quickly or very slowly. There may not be rigidity of abdominal muscles since some grade of peritonitis may exist coincidentally with a mechanical block. The obstruction may be incomplete symptoms. These, with still other diagnostic difficulties are usually quickly overcome, of course, but that the symptoms do not invariably lead one aright is attested by the fact that many surgeons do not hesitate to apply the therapeutic test, i. e., by use of drugs try to get an evacuation of the bowels. This appears, safer, too, than subjecting a post-operative case to an exploration which may prove needless and possibly fatal. Dr. C. H. Mayo (Annals Surg., 1917-LXVI) directs the use of various enemas on the second day after the operation and, if no relief is obtained, that night and the third day lavage, laxatives, enemas, pituitrin and eserine. "If these fail we may conclude that obstruction is present and complete." To overcome the stasis which follows abdominal operations under general anaesthesia and to secure the first post-operative evacuation this program is a

good one. Yet we must remember that, while this is the proper early treatment for paresis, except for the lavage and enemas, it can only do harm in the presence of actual mechanical obstruction. When, later in a case, symptoms suggestive of obstruction appear it is better to use lavage and enemas and watch and wait. Wait, not for typical symptoms—certainly not for stercoraceous vomiting—for typical symptoms are often too late for us to save our patient. Though rarely the affected portion of the gut is quickly damaged to such extent that a resection may be necessary, in the great majority of cases in a few hours to a day or two, depending upon the advance of the symptoms, the continued vomiting, failure of bowel movement or passage of gas, increased peristalsis, colicky pain, more or less distention and the mounting toxemia will give a safe lead to re-operation while our patient is yet able to withstand exploration and the proper handling of the condition found. It may be remarked here that the least radical procedure which promises relief is the one to be chosen.

As to cases of obstruction (and paresis as well) which for any reason have been allowed to become desperate, cases in extremis, enterostomy, with no anesthetic if the wound has not healed and under local anesthesia if it has, offers relief in a considerable percentage of cases. A limited exploration may be accomplished under this method and rarely this may enable one to relieve the obstruction in which case enterostomy may or may not be advisable, depending upon the necessity for immediate drainage of the bowel. Enterostomy may be easily, quickly and practically painlessly done under local anesthesia—without moving the patient from his bed if this is thought advisable; if properly done the enterostomy will close spontaneously in a majority of cases and while it should not be expected even the obstruction sometimes frees itself following drainage of the gut. Enterostomy with some variations in technique is practiced as a life-saving procedure by many of our leading surgeons.

The following case illustrates some of the above mentioned points: Mrs. B. B., age 36, referred (Dr. W. R. Thompson) for complete prolapse of the uterus. She had a mitral lesion and was very nervous—otherwise in good condition. She warned us that she was very susceptible to laxative drugs. June 12, 1920, after a few days preliminary treatment, the Murphy operation was done (i. e., the wings of the bisected uterus were anchored beneath fascia of abdominal wall)—convalescence to ninth day perfectly smooth, bowels moving without assistance since third day when oil was given—sutures removed—wound healed.

On the ninth day failed to have bowel movement and two compound cathartic pills were given at bedtime; began vomiting at midnight. Next day, tenth, still vomiting; pulse slightly accelerated, temperature normal, no rigidity, no distention, lavage and enemas were given. Eleventh day—condition as before except that pulse reached 120 and was weak but regular and complained of some pain over epigastrium, relieved by vomiting, no rigidity, no distention. In the afternoon a diagnosis of obstruction was made but preparations for re-operation were halted when our anesthetist had examined the patient and declared she would not withstand the ordeal. As two consultants had expressed doubt of the diagnosis it was decided to seek relief by use of drugs. Twelfth day—oil through a tube, pituitrin, enemas and change of position failed; oil was vomited eight hours later. Thirteenth day—treatment still failed except that some gas was passed with an enema, patient's general condition remained surprisingly good though now had a temperature of 100. Fourteenth day—had grown suddenly worse, pulse 140, temperature 102, vomited only three times in last 24 hours, no rigidity, slight distention, condition desperate. Did an enterostomy under novocaine, first sweeping finger about area where adhesions were probable, six to eight pints of fluid fecal material came through tube in ensuing 36 hours, then bowels moved naturally—tube dropped out on fourth day after its insertion and the enterostomy closed spontaneously on the sixth day. Patient left hospital entirely well on July 15th.

Technique—After usual preparation of abdomen and infiltration of tissues with novocaine the abdomen was opened through the upper two inches of the old incision. The omentum was lifted gently, being free, and a very gentle finger exploration made. Omentum was replaced and an opening made in it over the most available loop of distended gut. The parietal peritoneum was stripped back on either side just sufficiently for the purpose and the bowel with the omentum intervening was closely stitched to it. The angles of the peritoneal incision above and below the enterostomy site were now carefully closed thus the rest of the work is actually extraperitoneal. A purse string of silk was now placed in the bowel and a very small puncture made within the purse-string and a large catheter (No. 10 English) suture passed thru the side of the catheter to hold it in place. The catheter was now pressed against the side of the bowel and an additional suture taken to fold the gut over the catheter for about one inch. Closure of abdominal wall with two or three silk-worm-gut sutures.

ECONOMIC PROBLEMS IN MEDICINE*

By W. L. MOSBY, Bardwell.

The passing of the "saintly" old-time general practitioner and the coming of the modern specialist in medicine and surgery with the increased demand that the highest degree of skill available be utilized in the alleviation of the ills to which humanity is heir, has wrought wonderful changes in the profession to which we have the honor to represent.

So remarkable has been the achievement of medicine and surgery in the last few decades that the world has been astonished at its development.

The great work that had been done in an organized way by the leading clinics of the country prior to the great world war and the lessons learned during this destructive conflict served to emphasize the importance of team work, harmoniously and efficiently directed under a capable management, as productive of the highest degree of service possible in medicine and surgery.

The vision of man's duty to man in the light of modern knowledge requires that we serve intelligently and honestly, therefore the best is not too good and should be exacted by our discriminating clientele.

While law is retrospective and looks backward for precedent, medicine is prospective and looks forward to the utilization of all the cumulative knowledge of the ages in the alleviation of the suffering and the lengthening of the span of human life and its work of restoring health and happiness. Scientific achievement in pathology, bacteriology, roengenology, chemistry, therapeutics and the allied departments of medicine and surgery have become so voluminous and yet so inseparable from the scientific application of the essential principles of therapeutics that it amply justifies the development of specialism as we have it today. The environment of city life, with its increased opportunities for special work in study and practice with less effort and greater remuneration for similar service is attracting so many of the younger men of the profession that its ranks are being rapidly depleted in the rural sections of our country.

Our small County, with a smaller population some 20 years ago, had about twice the number of practitioners as now and yet we grow smaller year by year.

Is the telephone and automobile responsible for a reduced amount (seemingly so at least) of work, or does better hygiene and

*Read before the Carlisle County Medical Society.

sanitation actually reduce this amount of disease or do these modern conveniences enable the doctor to do this increased work more easily and economically today? I really believe the work is not really increased as much as it should be as so many are receiving absent treatment, we sent this case for a diagnosis, this for x-ray and radium, this for surgery, this for rest, diet, electricity, etc. Referring cases is a daily occurrence giving up not only patient but prestige and pay and receiving a demurrer on the balance of his account as well. Do we need the multitudinous operations being performed by our surgeons today? We believe the results will vindicate and justify the conclusion that we do. If so can the convenience and cost to client and the financial consideration to local professional interest be better protected? We believe it can in a large measure be both. You might ask, how? My answer to this question may be largely an opinion and somewhat problematic, yet we believe an effort should be made to bring it about. In its accomplishment we would develop a higher degree of skill and serve and conserve larger portions of our community. In our little town we have now four engaged in healing and health work, why could we not co-operate to increase service and economize in its administration by all using one central adjoining office in one building, with one bookkeeper for all, one technician for all, with or without one nurse for all, one waiting room, one x-ray plant, one laboratory, one microscope instead of none, and one up-to-date operating room, and other facilities and apparatus as needed from time to time to meet required demands. And why not the county society, with its ten or twelve active workers combine for convenience and better work and secure and maintain a small hospital centrally located for either community or county grouping, each member have his line to which he may be best adapted by training and practice and all do team work, both in diagnosis and therapy. I believe that our county should respond to the needs for such an institution and we in return make some concession in management in order to better home care for those needing such service, giving them the benefit of home up-to-date treatment and at a lower cost to them and a larger dividend to the practitioner. In many instances in our little town, our doctors duplicate each other in little used equipment such as Dupey's splints, books and journals, operating instruments and office paraphernalia, intubating sets, insufficient electric devices, thereby failing to conserve our meagre finance.

In the matter of collections harmony and conformity in charges and manner of col-

lecting would be uniform, protecting some of the best doctors who are possibly the poorest financiers. This again could be made to eliminate the non-payer who is glad to use and quick to abuse when services are not needed and remuneration is mentioned.

Referring to cases is a daily occurrence by members of this society, which by the way is the best society of its size in the state of Kentucky, and you know Kentucky has the best association in the world measured by our standard of thinking. I read with edification and delight Dr. W. W. Anderson's address delivered at the Lexington session of our association touching the many problems to be solved by our organized profession, timely and important and presented in such a masterly way.

If, in the light of advanced human knowledge and experience this increase in operative hospital and specialistic work is justified by the results, then we as members of this society and as citizens of Carlisle County should strive together to accomplish the work of relieving suffering humanity and placing medicine and surgery in our county on a higher plane, raising the standard of efficiency and preparedness so that we could do well and thoroughly the work entrusted to us as members of our noble profession.

EPIDEMIC ENCEPHALITIS*

By THOMAS FARRIS HALE, Louisville.

In view of the recent publication of comprehensive and authoritative papers on lethargic or epidemic encephalitis by Dr. Simon Flexner, in the Journal of the American Medical Association and by Drs. Barker, Cross and Irwin in the American Journal of Medical Sciences, I want to apologize for bringing this subject before the Society. The subject was selected before these articles were published. Heretofore, for the most part, only case reports and discussions had occurred in the more generally available medical journals.

In view of the fulness of the above mentioned articles, I have considerably abbreviated this paper and am presenting it mainly with the view of opening what I hope will be a full discussion of this interesting disease which is appearing with increasing frequency in this locality.

Dr. Flexner reported a case of lethargic encephalitis before the Society several months ago, and so far as I know, this was the first recorded case to occur here.

Dr. Flexner has very kindly allowed me to

*Read before the Jefferson County Medical Society.

show two lantern slides and a stained specimen of medulla from Dr. Simon Flexner's laboratory which illustrates the pathology of epidemic encephalitis. These will be shown at the end of the paper.

An examination of recent literature reveals the fact that a large number of cases of somewhat similar symptomatology have been reported and described under the caption of epidemic or lethargic encephalitis.

The history of medicine furnishes many instances in which diseases of totally dissimilar origin have been confounded for long periods of time on account of certain clinical similarities as, for example, the old confusion between typhus and typhoid fevers; between the principal venereal diseases and the dysenteries, and between the pneumonias. The practical result of this diagnostic confusion has been of course, inadequate treatment.

This paper, which is based principally on case reports and Neurological Society proceedings is an analysis of recent literature in the attempt to determine whether the same lack of clarity operates at present in respect of the symptom-complex known as lethargic encephalitis.

Another phase of this subject, which is of the greatest practical importance, has reference to differential diagnosis between the disease under discussion and some of the more common diseases. The importance of this was borne in upon me by five cases which I have seen during the past year, which strongly suggested the diagnosis of encephalitis lethargica, but which on complete investigation proved to be separate and unrelated conditions. One was a case of uraemia in a young man; another a case of tuberculous meningitis; one of early syphilis; one brain tumor, and the last a case of infected thrombosis of the jugular vein.

First, a few words concerning opinions as to etiology which have been advanced: Early investigators, especially the English, believed the disease to be due to food intoxication. In this country also cases of botulism have certainly shown resemblances to epidemic encephalitis. This theory is no longer tenable. In a suspicious case, however, the possibility of food intoxication must certainly be considered.

In some quarters it was supposed there might be some etiological relationship between the disease under discussion and the Heine-Medin disease. The two main objections to this theory consist in the facts that the pathological changes in the nervous system are essentially different and that animal experimentation with material from cases of epidemic encephalitis has failed to show any clinical or pathological picture resembling the Heine-Medin disease.

Pathologically, the destructive changes in the nerve cells so characteristic of the latter are practically absent in epidemic encephalitis and this difference is reflected in the clinical manifestations in that residual paralyses which are the rule in poliomyelitis are very rare in epidemic encephalitis.

Studies of geographical incidence have not shown any relationship between these diseases.

A more plausible relationship was thought to exist between influenza and epidemic encephalitis. Certainly many cases of post-influenzal encephalitis have occurred subsequent to this and to previous epidemics, but the hemorrhagic nature of influenzal encephalitis with its tendency to abscess formation, serves to distinguish it from the lesions of epidemic encephalitis. Furthermore, Pfeiffer's bacillus, which has been frequently isolated from these cases of influenzal encephalitis has not been found in cases of epidemic encephalitis.

Other etiological theories have arisen in consequence of recent bacteriological examination of fatal cases. Several workers in this country and abroad, have described a gram-positive coccus-like organism. Hala and Smith of Brooklyn, have isolated, both ante and post-mortem, a hitherto undescribed gram negative motile bacillus. These findings lack confirmation and have not been generally accepted.

By using naso-pharyngeal material from fatal cases the disease has been transmitted to animals, and the resulting lesions have corresponded closely both in character and in location to those found in fatal human cases. The lesions so produced appear to be due to a living virus rather than to a toxin of infectious origin.

From the foregoing, it may be seen that while nothing definite has been established concerning its etiology, it is generally agreed that epidemic encephalitis is a communicable disease of infectious origin, unrelated to encephalo-polio-myelitis or to influenza.

Pathologically the disease is characterized mainly by perivascular round cell infiltration. Round cell infiltration occurs also interstitially.

There is no neurophagia; nor are polymorphonuclear cells frequently encountered. The lesion is said to be indistinguishable from that of a trypanosomiasis.

The pathological changes most commonly occur in the mid-brain, and medulla. The cortex, corpus striatum and optic thalamus may be involved. Less frequently changes occur in the cord. This distribution is in marked contrast to that of encephalo-polio-myelitis where the lesions are most character-

istically found in the cord and very rarely in the fore and mid-brain.

Clinically, the disease is protean in its manifestations, as would be inferred from the distribution of the lesions. McNalty has suggested a classification of the cases based on the location of the lesion in the central nervous system as shown by clinical phenomena.

The general evidences of infection are present. There is usually a low grade temperature and slight leucocytosis.

The earliest described cases showed fundamentally diplopia, ptosis and an obscuration of consciousness which was thought characteristic of the disease. Many cases have showed involvement of other cranial nerves.

In more recent cases, rigidities, contractures and clonic muscular contractions have been recorded, and have been so marked as to strongly suggest the diagnosis of hysteria. The muscular symptoms are typical of extrapyramidal lesions and are of localizing importance. These symptoms differ from those caused by involvement of the pyramidal tracts in the absence of paralyses and increased reflexes.

Other mental symptoms beside lethargy may occur. There may be mild delusions, confused states, or extreme restlessness which may suggest acute psychosis.

The spinal fluid is usually clear. There may be a slight increase of globulin and small, round cells. Dry taps are relatively frequent, though some observers report a slight increase in pressure.

The eye grounds are usually negative. Many cases, however, show a low grade optic neuritis, without choking of the disk in one or both eyes.

The mortality has varied in different series of cases from 20 to 70 per cent. In eight cases reported recently by Barker, Cross and Irwin no death occurred. Cases are said to terminate fatally in consequence of involvement of the respiratory center.

Reference has already been made to a number of diseases with which epidemic encephalitis may be mistaken. Cases in which confusion has occurred have fallen in one of the following categories:

1. Other gross brain diseases, as meningo-encephalitis, due to various organisms; tuberculous meningitis; syphilis; brain tumor and abscess in silent areas; and in cerebral thrombosis.

2. Non-infectious intoxications, as botulism, lead poisoning and uraemia.

3. Psychical disturbances, as acute psychoses and hysteria. Siemerling, of Kiel, has called especial attention to the frequency with which epidemic encephalitis and acute psychoses are confused.

Diagnosis of epidemic encephalitis will frequently be made only after an exhaustive diagnostic study.

The treatment is symptomatic; no specific therapy has been evolved.

SUMMARY

1. Epidemic or lethargic encephalitis is apparently a communicable infectious disease of undetermined etiology. It seems highly improbable that this disease is related etiologically to the Heine-Medin disease or to influenza.

The mode of transmission is unknown.

2. The symptom-complex of this disease may occur in a large number of common unrelated conditions of an infectious or toxic nature and moreover may simulate certain psychoses.

The most important practical application of this paper has reference to the differential diagnosis of epidemic encephalitis from these more common diseases which are more amenable to treatment.

DISCUSSION:

Stuart Graves: In some cases of epidemic encephalitis, post-mortem microscopic sections have shown minute punctate hemorrhages along the floor of the fourth ventricle, the lateral ventricle, the optic thalamus, and sometimes the cortex. Two cases, possible of this character, have come to autopsy in the Louisville City Hospital and sections from the mid-brain are now being made.

In an article published in the *Journal of the American Medical Association* for March 27, 1920, Dr. Simon Flexner states that the pathology seems to be so constant that a diagnosis can usually be made from the microscopic examinations of sections alone. The section which we have here under the microscope shows typical perivascular infiltration, minute punctate hemorrhages, and also interstitial infiltration. From casual study of the section, however, it is impossible to determine whether there are any definite retrograde changes in the nerve cells such as have been described in articles and pictures that I have seen.

Carl Weidner, Sr.: Do you think it would be possible to distinguish, from the microscopic appearance of the sections alone, disregarding the clinical history, the disease under discussion from other affections?

Stuart Graves: I believe it might be possible. The majority of the cases that come to autopsy are not definitely diagnosed encephalitis. In our first case the disease was not suspected; in the second, which occurred in the City Hospital, a tentative diagnosis of encephalitis was made, but this was not positive before autopsy was performed. Dr. Flexner says he is able to diagnose the disease from the histological changes alone.

The picture is unlike cerebral syphilis, tuberculosis, or poliomyelitis.

Wm. A. Jenkins: My interest in rather than my knowledge of the subject prompts me to make a few remarks. It is said that the less we know about a subject the more we can talk about it, and that is generally true in all medical discussions of obscure subjects.

I noticed recently in the *index medicus* an enormous list of references to medical literature on the subject of *encephalitis lethargica*. One of the best resumes I have seen was Dr. Simon Flexner's paper published in the *Journal of the American Medical Association* for March 27th, to which reference has already been made.

Quite a number of these cases have come under my observation. I have never had an opportunity of seeing an autopsy, to assist in one, or to see the findings of an autopsy, on a case observed clinically; but I have personally known of a fair number of them to present what Dr. Flexner considers fairly typical symptoms. I have known of a few patients who died rather promptly, and a few with pronounced symptoms that I have followed have gotten well.

Dr. Flexner states that the pathology is so definite and distinct that the diagnosis can be made on that basis alone. He emphasizes the diagnostic importance of punctate hemorrhages, perivascular cellular infiltration, the round lymphoid cells predominating, a tendency of the round cells to infiltrate the large cell nuclei in the fourth ventricle, the lateral ventricle, and the optic thalamus. This, of course, is aside from any involvement of the cranial nerves. And lastly slight edema in the neighborhood or the changes already described.

Clinically speaking, lethargy is one of the most prominent symptoms. According to Flexner, this is present in about eighty per cent of instances, and it was true in the majority of cases coming under my observation. However, I have seen one case, and have known of several others, in which there was mania, or a state of excitation, rather than lethargy.

A patient (female) was referred to me the latter part of December, 1919, the family physician being unable to make the diagnosis. There was cranial nerve involvement, ptosis, diplopia, and motor inco-ordination. She could be aroused with difficulty; she became profoundly lethargic; someone even had to hold her baby to the breast while nursing, otherwise it would have fallen. Fever is usually present of an irregular type.

The next most prominent symptom is cranial nerve involvement, particularly of the third, in some instances the fifth, the seventh, etc.; but nearly always some nerve connected with the ocular apparatus.

In some cases early symptoms are more or less prominent, the patients have considerable fever, headache, coryza, etc., followed by ptosis, diplopia, and other symptoms. They then lapse in-

to a profound lethargic state from which they can be aroused with difficulty.

I recall one case in which there was marked spinal cord involvement. There was first considerably lethargy, some disturbance of the facial muscles, resembling Bell's palsy, then lethargy deepened and marked spinal cord involvement was noted. Both sphincters became completely relaxed, the knee jerks were absent, and there was evidence of muscular atrophy in both legs. The patient became so lethargic that she could be aroused only with the greatest difficulty. After a lapse of several months she made a satisfactory recovery. That is the only case I have seen in which there was marked spinal cord involvement.

The spinal fluid in these cases is always under pressure, there is considerable increase in the cell count, but no organisms the fluid being perfectly clear in every case. It is best to make spinal puncture to be sure that the case is not one of sporadic cerebro-spinal meningitis.

The diagnosis should not be made hurriedly. The suspected case should be observed with the greatest care. The prominent or out-standing symptoms should be gathered, correlated and analyzed. Finally, the method of exclusion, plus the fairly definite and uniform knowledge which we now possess of symptoms and pathology, will enable us to make a reasonably positive diagnosis in most instances.

S. G. Dabney: The subject of *lethargica* or epidemic *encephalitis* was thoroughly discussed at the last meeting of the American Ophthalmological Society, particularly by Woods, of Baltimore, who reported seven cases; by DeSchweinitz, who had several cases; and by another gentleman, who reported forty-eight cases.

The majority of these patients consult the oculist first. In DeSchweinitz' case "mostly the only muscle affected was the external rectus." I have seen four cases and all had paralysis of the abducens; in one there was involvement of the pupil; in another facial paralysis was a prominent symptom.

The first patient was eighteen years old, the son of a physician, brought to me because of double vision. He did not look well, his temperature at the time was 101 degrees F. He was far from being lethargic; on the contrary he was decidedly excited. He gave the history that ten days previously he had an attack of vertigo; this was the earliest symptom, preceding the diplopia. I advised that a careful examination be made by the family physician and also a neurologist. Blood and spinal fluid, Wassermann, urinalysis, examinations of the reflexes, etc., were negative.

Within a few days this boy became profoundly lethargic and remained so for quite a while; his temperature ranged about 100 degrees F. His pulse at one time was between 40 and 50. He

remained in profound stupor most of the time; he could be aroused with difficulty; his pupils were dilated, the right being larger than the left. Lethargy is not always the first symptom in these cases. The initial manifestation is usually great listlessness, but sometimes there is decided excitement with a tendency toward delirium. In this case the first symptom was vertigo; the patient later had considerable excitement, followed within a few days by profound stupor. He had fever, headache and double vision from abducens paralysis. It was because of the latter symptom that he sought the aid of a physician.

The second case was a young lady who consulted me February 28th. She complained of intense headache which it was thought might be due to defective vision. Examination showed an indistinct haziness about the optic nerve, and there was fulness of the retinal veins; her temperature was 101 degrees F. She had double vision, due to abducens paralysis; also distinct paralysis of the facial nerve. Two of the cranial nerves were therefore involved in this case. Her lethargy was never profound; it was rather of a somnolent type. She had three symptoms: headache, fever, paralysis of the abducens and also the facial nerve.

The third patient was a young man brought to me because of double vision. He had an attack of vertigo, followed by disturbed sight and consulted a physician in another city who thought it was a bilious attack and prescribed purgatives. His temperature was 101 degrees F., and he exhibited mild excitement at first rather than stupor. He complained of intense headache, and I understood subsequently developed typical stupor.

The fourth patient was a nurse at the Louisville City Hospital. When I saw her she had recovered from many of the symptoms, but still had double vision; her temperature was 101 degrees F.; she had headache and great listlessness. She had no profound stupor at any time.

It seems a strange coincidence that in these four cases double vision was due to paralysis of the right abducens nerve. The left side was not involved in any of them.

Curran Pope: I shall not attempt to describe nor recount the symptoms which may occur in encephalitis lethargica. We are all groping more or less in the dark in the handling of these cases. While I would not for a moment attempt to controvert any statement made by our distinguished friend, Dr. Simon Flexner, it seems to me there is nothing in the pathologic picture shown by the slides exhibited that is distinctive or characteristic of these cases. The picture appears more like an attempt at brain-tissue repair than any distinctive pathology.

I want to subscribe to the so-called pressure theory of the pathology in these cases, particular-

ly in so far as it involves the basal ganglia. This may explain many of the symptoms, especially the lethargy, occurring in the course of the disease. The lethargy will depend upon the amount of the pressure as well as its extent. Many of you will recall an interesting case recorded thirty years ago by a German physician in which the individual could only communicate with the external world by one eye and one ear. By closing his one eye and obstructing the hearing ear sleep was produced by lowering the threshold of consciousness. Pressure on the basal ganglia would obstruct impressions from the special centers and the periphery and in that way the threshold of consciousness is lowered and the individual tends to sleep.

What I particularly wish to record is a personal observation which I have not seen in the literature, i. e., that in due course of time the temperature of the patient subsides and is then apt to take a subnormal course, and with that subnormality there is a slow, weak, flabby pulse. The only explanation I can suggest concerning that feature is that perhaps we have to deal here with the action of some toxin which may have produced asthenia, probably an adrenal-asthenia. I know the best results I have been able to obtain in combatting this complication have been obtained by the use of nux vomica and strychnine.

I have seen seven cases of encephalitis lethargica. Five of the seven had paralysis of the abducens nerve; in one the eyes were not involved. Of these five patients one was left-handed, the other four were right-handed; the abducens paralysis invariably occurred on the right side. In four of the seven cases vertigo was noted as the initial symptom; in five cases tension and exhilaration preceded the attack.

As to the question of treatment: The only therapeutic suggestion I can offer is:: where the patients were restless and more or less perturbed, spinal puncture has had an excellent influence, i. e., the patients seemed better after the spinal puncture than before. Whether that was coincidental or not I cannot say; but I simply offer the suggestion that not only is spinal puncture of use as a diagnostic measure, but benefit may ensue from drainage of the spinal fluid.

W. F. Gardner: Inasmuch as the laboratory findings in encephalitis lethargica are negative, one must necessarily depend upon the clinical phenomena in making the ante-mortem diagnosis. However, it seems that post-mortem pathological findings are more or less constant and definite, indicating that the disease is a distinct entity. Examination of the spinal fluid shows negative results, which merely assists in eliminating cerebro-spinal meningitis, acute anterior poliomyelitis, and possibly other affections. However, there are certain confusing clinical fea-

tures; for example, in cerebro-spinal syphilis the patient may have diplopia and somnolence; stupor may accompany cerebro-spinal meningitis and also poliomyelitis. The absence of an increase in cell count in the spinal fluid is an important factor in the process of elimination.

In making the clinical diagnosis of epidemic encephalitis we must consider the triad of symptoms noted and agreed upon by most observers, viz, lethargy, fever, and cranial nerve involvement. While all three of these manifestations may not co-exist in every case, to make the diagnosis based upon clinical phenomena at least two of this triad should be present. The conditions for which epidemic encephalitis are most likely to be mistaken are: toxic psychosis and confusional insanity; such cases have not infrequently been mistaken for epidemic encephalitis; but the triad of symptoms being remembered differentiation can usually be made. Headache is often present, but this also accompanies the other diseases mentioned.

Many observers mention the occurrence of epidemic encephalitis coincident with or subsequent to influenza. There is great divergence of opinion as to whether the disease is allied to influenza. As regards communicability of the disease opinions also differ.

Carl Wiedner, Sr.: I have seen only one case of epidemic encephalitis in which the clinical diagnosis was made. That case corresponded to the typical clinical picture as described by the various speakers tonight; headache, pain, neuritis, eye symptoms from involvement of the third and sixth cranial nerves, stupor, paralysis of the rectal and vesical sphincters, were the symptoms present.

In another case which I now believe was epidemic encephalitis, the patient died and I signed the death certificate "edema of the brain." The patient was a traveling man who had always led an active life. He returned from a trip west and had a chill followed by some fever, he had severe headache and great muscular movements choreiform in character accompanied by pain in different parts of the body, he had no vomiting and at first his pulse was normal. After a few days his pulse became rapid, then slow; temperature 101.5 degrees F.; patient very nervous, restless, and delirious. He became comatose a few hours before death. I made the diagnosis of cerebral edema based on the clinical signs present.

I would like to inquire whether symptoms of this kind are common in encephalitis lethargica? The age of the patient seems to be without significance, cases having been reported in individuals of seventy and over. The mortality varies between 20 and 70 per cent. The duration of the disease is indefinite and the etiology uncertain. Nothing seems to be known about prophylaxis.

H. A. Davidson: In one case of encephalitis lethargica coming under my observation, in a woman aged twenty-seven, the clinical diagnosis was finally made by exclusion, and I believe that is the only way it can be done. The blood, urine, cultures of discharges from the nose and throat, were all negative. The patient had unequal pupils; lethargy, temperature ranging from 102 to 103 degrees F., higher in the morning than in the evening, but no headache. In the beginning of the attack exhilaration was extreme and she was unable to sleep; a day or two later she complained that she could not see well. She had no pain at first, but later developed "sciatic pains," which persisted for twenty-four hours and then disappeared. A few days afterward profound lethargy supervened; it was difficult to keep her awake long enough to take food. The most marked symptoms in the majority of these cases is lethargy. Dr. Adolph O. Pfingst saw the patient and examined her eyes before lethargy developed; and Dr. Curran Pope was later called in consultation. The treatment was purely symptomatic. The woman is making a satisfactory recovery.

Adolph O. Pfingst: I am afraid that the members of the society may have gained an erroneous impression as to the relative frequency of the ocular symptoms in epidemic encephalitis from the remarks of Dr. Dabney, who has happened to find paralysis of the abducens nerve in most of the cases that he examined. At the last meeting of the American Ophthalmological Society which I attended, an entire day was devoted to the discussion of the subject before us tonight and it was my impression that the consensus of opinion was that ptosis is the most frequent eye manifestation of the disease. Next in frequency other branches of the oculo motor nerve was involved. With almost equal frequency nystagmus was present. Paralysis of the fourth and sixth nerves and involvement of the intrinsic muscles of the eye were less frequently observed. I have seen little mention of paralysis of the intrinsic muscles. In the case mentioned by Dr. Davidson this was the only symptom present when I saw the case. There was no evidence then of abducens paralysis as was just reported by Dr. Pope in this case. Movements of all of the extrinsic muscles were normal. The intrinsic paralysis accounted for her inability to read print. Her vision for distance was apparently not affected.

Today I saw a young woman at my office who has recently recovered from a protracted illness, during which she was comatose for days at a time—displayed a marked tendency to sleep and had ocular disturbances, such as ptosis, nystagmus and diplopia. When I saw her she had a slight ptosis and an inability to see close objects clearly. Diagnosis of epidemic encephalitis was made in her case.

From what I can gather the eye symptoms not only come on early as a rule but are as constantly present as the lethargy in epidemic encephalitis. Lethargy is frequently absent. Some cases have a peculiar indifference or apathy rather than a real tendency to sleep.

J. R. Peabody: I recently attended a meeting of the Chicago Ophthalmological Society where this subject was thoroughly discussed by both ophthalmists and neurologists. So far as I am able to judge they are no more familiar with the disease in Chicago than we are here. Several cases were reported and the symptomatology outlined; no eye muscle was invariably affected; some of the patients had ptosis; in some the external recti were involved; in no case was there fundal changes.

Shortly afterward I had the opportunity of seeing a patient with so-called encephalitis lethargica. The man was so far from being lethargic that he was in a straight jacket; he was maniacal; but the diagnosis of encephalitis lethargica had been made. In our enthusiasm about this disease we ought not to overlook other and more common affections.

One point not mentioned tonight is the importance of examining the ears in every case where meningeal or brain symptoms are manifested, especially in chronic suppurative otitis. Where the patient has had a discharging ear for a number of years and suddenly developed meningeal or brain symptoms, the cause might be overlooked unless the ears were carefully examined and the history obtained. In thrombosis of the lateral sinus the patient is often in a lethargic state such as occurs in encephalitis. We ought to exclude all of the more common affections before making a diagnosis of encephalitis.

T. F. Hale (closing): Dr. Gardner said certain acute psychoses might readily be mistaken for epidemic encephalitis. I remember one case coming to autopsy in which the diagnosis of encephalitis lethargica was made post-mortem.

From the clinical signs present I was at first led to believe the case was an example of one of the acute psychoses.

So far as the differential diagnosis is concerned: I did not lay any stress on the means of distinguishing epidemic encephalitis from diseases showing a similar symptom-complex, because the differentiation methods are sufficiently well known. Neither did I wish to consume time in discussing the clinical manifestations; these are also well known to the members of this society.

FURTHER OBSERVATIONS IN SYPHILIS OF THE CENTRAL NERVOUS SYSTEM WITH REPORT OF CASES*

By GEORGE H. DAY, Louisville.

The late Sir William Osler has said, "he that knows syphilis knows medicine." Can we go further and add, he that suspecteth all men of being syphilitic until proven otherwise; maketh diligent search by sundry and divers proceedings, will be rewarded thereby many fold.

It is questionable whether syphilis is more prevalent than formerly, or, instead of such being the case, whether with our advanced training, we are finding cases now that were undiagnosed in the past. Certainly with the diagnostic adjuncts offered by the modern laboratory, the opportunities offered for the training in our clinics, the literature abounding with the observations of experienced workers, makes diagnosis easier for the practitioner in general and the specialist in particular.

With the salvarsan era, we are taught that owing to the inadequate treatment of mercury by mouth and inunction of former days, many cases of neurosyphilis will be observed which would otherwise have been prevented. Certainly, many cases persistently treated remained uncured until the advent of salvarsan, but it must be remembered that salvarsan is in no wise a specific and until its limitations are understood and treated accordingly, we will receive the maximum in return for a correct understanding of such an adjunct. At this time, the treatment of acute syphilis is a comparatively simple problem. The simplicity of preparation of neo-salvarsan, that ease of administration, the quickly attained results in the clinical picture, gives us a "false security that is quite insecure" and it is also quite probable that at some later time we will see many cases of neurosyphilis in patients who had been undertreated and allowed to slip into the realm of so-called cures. We know that persistently negative blood does not always mean that the syphilitic is cured. We also know that no patient should ever be discharged as cured without many negative bloods and a negative spinal fluid.

Corbus on examining his so-called cured cases, found on spinal puncture that 18.3 per cent had cerebro-spinal manifestations. These were resting in the security of persisting negative blood Wassermanns and to all intent and purpose were cured, none having symptoms or lesions of any kind or description.

*Read before the Jefferson County Medical Society.

Results in syphilis must be dependent relatively upon several facts—first, on time of instituting treatment while the disease is in the so-called primary stage; second, the power of resistance of the host and the type of infection; third, method of treatment and the qualifications of the physician extending such treatment.

Of the first we know that with an initial lesion, a positive dark field before the blood is positive, offers the greatest possibility of an early cure. In the second class we know that the resistance of patients vary both to the infection and to treatment. There are unquestionably different strains of spirochaeta and many times we see patients with a lowered resistance and a malignant type of infection develop neurosyphilitic symptoms with astounding rapidity in spite of well-directed treatment. We know that with an early diagnosis in acute syphilis a series of six lvsarsans followed by fifteen intramuseular injections of mereury will usually give us a negative Wassermann. If not it is repeated until it is negative. When the negative is attained, mereury in series properly managed at the end of a certain period give us a cure, provided of course the treatment is checked by frequent Wassermann, and in every instance a spinal puncture be made before pronouncing the patient cured.

It is my belief that we should adopt a standardized treatment, one that can be applied to the average case, meaning of course that a certain line of treatment be applied until the patient has a negative blood, and when negative a further certain line until cured. Conditions arising in exceptional cases would of course alter the routine, treating the blood primarily and the patient secondarily. Of course, we should not do routine treatment, so many doses of salvarsan and mereury for each and all alike, irrespective of the personal equation.

At this time I believe that on the whole the treatment of syphilis is practically standardize, that most of the men in this line are following closely to this method of attack. It is in the cerebro-spinal types, that at this time holds our interest. The wide diversity of opinion existing among certain workers in this field, as to the value of certain treatment in cerebro-spinal syphilis, makes it imperative that we consider these questions in the light of the results attained in our own experience, each of us, all of us must believe in results individually attained, for it is only the results that count after all.

There are comparatively few questions of treatment that cannot be settled within the range of our individual work. Each man in

this Society is entirely capable of judging whether certain treatment is effectual in whatever condition he may attempt experimentation and his results should be evidence conclusive as to the merit contained therein. To that end I wish to emphasize again the value of proven clinical results individually attained.

At this time two methods of treatment are advocated in neurosyphilis. One is by the intravenous route, championed by Sachs and his followers, while the other is the intra-spinal method advocated by Swift, Ellis, Ogilvie, Fordyce and others. Each has published widely his results and the wide diversity of opinion makes it imperative that certain conclusions be reached. It is not within the province of this report to go into the question of whether the choroid Plexus is impermeable to medication introduced intravenously. We have checked carefully our series comprising treatment by both methods and are convinced by results that no hard and fast rule can be set down for a routine.

Sachs says, "the large experience of late years has convinced me and my associates, that the hopes placed on this intraspinal method were unwarranted, and that arsenic given intravenously does appear in intra-spinal fluid in appreciable quantity and that injections or salvarsan or neo-salvarsan produced results that were entirely satisfactory and that they were at least comparable with those obtained by intra-spinal medication." He further says, "for tabes I cannot claim any actual cure, nor has it helped men to effect a cure in paresis." He admits "that a large number of private cases in which intravenous treatment had been given from the onset, the symptoms have progressed and full fledged tabes have developed in much the same way as if no active treatment had been given."

It would be very unfortunate indeed if the statements contained in this article were allowed to pass unchallenged, especially when the admission is made that no cure was obtained in either tabes or paresis. The writer also attempts to discredit the value of serologic examination of the spinal fluid for diagnosis and guide for treatment.

Fordyce, says, "It does not require the experience of a trained neurologist to convince these patients that their condition has been changed from hopeless invalidism to comparative good health. The advocates of intra-spinal therapy have never claimed for the method that it should be used to the exclusion of the intravenous, nor have they claimed that the choroid plexus is impermeable in all cases and that remedies introduced intravenously could not reach the cerebral or spinal tissues. On

the contrary, it has been repeatedly stated that many cases of syphilis of the nervous system are favorably influenced or cured by this method." With these statements I am in full accord. Many times have I observed patients with manifestations of the nervous system, relieved of their symptoms, with a coincident improvement in the serologic picture of both blood and spinal fluid by intravenous salvarsan administration. Again many times have we seen patients who failed to improve under the most intensive treatment; where all the symptoms were rapidly increasing, and on the administration of intra-spinal treatment, see these patients restored from invalidism to full health, a fluid cell count of 50, a positive globulin and Wassermann, changed to normal cells and negative globulin and Wassermann.

The following histories and laboratory findings are submitted for illustration of both the intravenous alone and the combined intravenous and intra-spinal.

Case 1. A man of 43, reporting for treatment Nov., 1913, with history of chancre 18 years previously. Had two years treatment immediately following infection, more or less irregular since then.

A fairly robust man of nervous, high-strung type. His pupils were unequal and responded sluggishly. The reflexes were all present. He complained of pains in lower extremities and of being nervous. He was sexually impaired and also had bladder symptoms. His blood was 4 plus.

A spinal puncture was not made at this time. He was placed on treatment, receiving 18 salvarsan and 120 injections of mercury during the following three years. At the end of two years treatment, spinal puncture revealed a cell count of 26, globulin positive, and Wassermann 2 plus. He refused intraspinal treatment, saying he was greatly improved and treatment by injection was continued regularly with occasional rests. In April he reported after some 14 months rest that he was again having the same symptoms, with the additional one of not being able to concentrate his mind on business affairs. His spinal fluid showed cells 14 globulin positive and Wassermann 2 plus. He consented to intraspinal treatment and has received nine during 1919. On the third injection the fluid turned negative and has since remained so. He feels normal in every way and is able to follow a very active business life.

Case 2. A woman of 46 with syphilitic meningitis. Infected by husband. She had no history of initial lesion or secondaries. Aside from several miscarriages had nothing suspicious in her history until April, 1914,

when headaches appeared. These rapidly became worse until on reporting to me in November, 1915, she had a typical meningitis.

The blood was 3 plus, and treatment instituted, receiving 9 salvarsans and 150 mercury injections. Her condition improved slowly and in November, 1917, her spinal fluid was negative.

Neither she nor her husband would ever consent to spinal puncture until this time. She also had 6 negative blood Wassermans. She has since remained well, able to attend her duties as housewife.

These two cases, illustrate that No. 1 improved physically, his symptoms were controlled while under treatment, and his blood had continuously remained negative. On the secession of treatment his symptoms returned exaggerated, and while treatment had influenced the laboratory findings, the fluid however was positive. On intraspinal treatment improvement was immediate and the fluid was turned promptly and remained so.

In case No. 2 treatment as suggested by Sachs was sufficient to entirely control symptoms, blood and fluid.

No rational man can claim and advocate his plan to the exclusion of all others. Personally, I believe that it is a mistake to advance the idea that intraspinal therapy has no place in medicine. Also it is just as erroneous to stand by and routine every case by the intravenous method irrespective of results or laboratory data. I believe and so follow that the method of Fordyce of combining the two plans, is the one of choice and my results are entirely satisfactory both to myself and my patients.

The procedure to be followed and the technique of preparation of the fluid is as follows:

In patients with a negative blood and a positive fluid, a provocative injection of salvarsan should be administered and the Wassermann retaken at stated intervals. If it remains negative, subarachnoid may be given at once. When both blood and fluid are positive two or more injections of mercury should precede the intravenous administration of salvarsan and after two or three doses of the latter the intraspinal injections instituted, supplemented by the intravenous. In paresis the usual practice is to begin the intraspinal injections after the first intravenous treatment. The intervals between doses, and this applies to both routes of introduction, are regulated by the reaction produced. When intraspinal injections are well borne, they may be given in series of four to six one to two weeks apart with a rest period of four to six weeks, and then another course, and repeat

as to symptoms and laboratory findings.

The serum is prepared according to the Swift-Ellis-Ogilvie-Fordyce⁵ modification, and is as follows: The patient is given an intravenous injection of arsenobenzol and approximately one-half hour later, 50 c.c. of blood are withdrawn from an arm vein. This is permitted to clot over night in the refrigerator. The next morning it is centrifugalized and the serum pipetted into a sterile tube. After a second centrifugalization to insure removal of all red blood cells, the clear serum is pipetted into another tube. To this is added the desired amount of salvarsan; namely, from 1-10 to 1-4, 1-3 or in certain cases of paresis 1-2 mg. This mixture is then inactivated at 55 to 57 degrees C. for one-half hour. In the administration of the medicated serum, a lumbar puncture is made and 10 to 20 c.c. of fluid withdrawn. A gravity tube with a capacity of about 40 c.c. is attached to the needle and the fluid is allowed to flow in until it holds about 30 c.c. To this is slowly added the serum and the mixture permitted to flow back into the canal.

This modification of the original Swift-Ellis has several distinct advantages. In the original we were always quite undetermined as to the amount of salvarsan the patient was receiving; there were also quite a number of cases reported where no improvement of either symptoms or laboratory findings were noted. In this I am not entirely in accord. I have observed cases that had received treatment by the Swift-Ellis in which there was still positive fluid and on administration of the fortified serum, a more rapid improvement both of symptoms and fluid was noted. It has the decided advantage of having a definite quantity of salvarsan easily controlled with a decided lesser quantity of serum. It is also of value in that several doses can be prepared from one serum and numbers of patients treated at one time. It is known that autogenous serum is not always necessary and that serum removed from one patient is entirely dependable in another case, the paramount point being in the perfect laboratory technique of serum preparation.

A case in question showing this point comparatively:

Case 3. Tabes: Man, age 40, syphilis 10 years ago. Treatment for 3 years, none until 1916, when intraspinal treatment by Swift-Ellis method was instituted. He received eight intraspinal injections. He said he was relieved of his symptoms for a time but relapsed some six months after having the last injection. In August, 1919, was referred to me. He was having severe pains in legs, girdle sensations, bladder crisis. His pupils were sluggish, Romberg present. Re-

flexes slow. Blood Wassermann negative. Spinal fluid, cell count 55; globulin positive; Wassermann 1 plus. He was also intolerant to mercury by injection.

With the blood Wassermann negative, intraspinal treatment was instituted in September, 1919, with a preliminary course of mercury by injection. He has received five injections of serum fortified with salvarsan beginning with an initial dose of 1-10 mg. and increasing as to reactions to 1-4 on the last one.

Date	Cells	Globulin	Wassermann
9-26-19	55	positive	1 plus
10-17-19	24	positive	1 plus
11-14-19	15	positive	1 plus
11-26-19	12	negative	plus minus
1- 3-20	17	negative	negative

Injections will be given until his fluid is normal and he will report thereafter for puncture relative to future treatment.

At this time I wish to report the results and laboratory findings on my first case treated by intraspinal route combined with the intravenous, entirely by Swift-Ellis method.

Case 4. Taboparesis; optic atrophy. Man, age 42, chancre and secondaries in 1898. Treatment internally for two years. No further symptoms until November, 1910, when his mental condition became hazy with memory and speech defects. Shortly afterward he had a convulsion and remained in coma 1 hour. This was attributed to some intestinal condition and was treated accordingly. He improved rapidly and several days later went to Texas where he was employed. He developed several mental symptoms while there and became very violent. He was taken to his home in Cincinnati, where he remained three months, being sent to Hot Springs, Ark., where he had 42 injections. Being much improved he returned to Cincinnati and his business for five weeks. Nothing that he was again failing, he returned again to Hot Springs, and took another course of 44 rubs and baths. During his first visit at the Springs he noticed a beginning failing of vision. He reported to me for treatment in February, 1912. His mental condition was hazy and all questions were answered incoherently. He was depressed and his vision was markedly impaired. Sexual power absent; bladder crisis; gait unsteady, apparently from defective vision. All of the reflexes very active. During 1912 and 1913 he was given intensive treatment of mercury by injection and iodide by mouth. He improved to a degree but was unable to return to business. In March, 1914, intraspinal treatment was instituted and immediate improvement

was noted. He returned to business during 1914 and has continuously been employed.

Treatment from February, 1912, to January, 1915:

One hundred injections of mercury; 6 courses of injections; 6 courses of iodidi; 12 intravenous injections salvarsan; 6 intraspinal injections Swift-Ellis.

CEREBROSPINAL FLUID

Date	Cells	Globulin	Wassermann
3-20-14	62	3 positive	4 plus
4-9-14	30	3 positive	2 plus
4-20-14	30	3 positive	2 plus
5-1-14	16	negative	plus minus
5-20-14	7	negative	plus minus
6-20-14	5	negative	negative
3-17-19	6	negative	negative

The reactions were rather severe and he refused further treatment although he was advised to continue. He also refused examination of fluid until quite recently. Numbers of blood Wassermans have all been negative.

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DISCUSSION:

W. J. Young: There is no condition in medicine which may remain so long unrecognized and hence neglected as neurosyphilis. When we consider that the invasion of the spirochæta pallida into the central nervous system is during the secondary stage of syphilis, and the fact that neurosyphilis may manifest itself in symptoms during the patient's life time, it is easy to realize its importance.

In treatment I believe the patient should always be given intravenous injections first to see if the condition may be reached in this manner. Should intra-spinous treatment be deemed necessary, I prefer the Swift-Ellis serum treatment fortified by the addition of arsphenamin one-twentieth to two-fifth milligram popularized by Dr. John A. Fordyce.

The great trouble in these cases is that we institute treatment too late to benefit any but the distressing symptoms. If these patients could

be treated while the disease is in its incipency the results would dispel all doubts as to its efficiency.

A. O. Pfingst: The last case reported by Dr. Day was one of extraordinary interest, both from the standpoint of its clinical features and its response to modern anti-syphilitic treatment. I saw this man first in 1912, when he was forty years old. At that time he complained of imperfect vision, but upon examination I found that he had perfect central vision (20-20 plus,) but that he had a very limited field of vision. The ophthalmoscope revealed a well-marked atrophy of both optic nerves. It is of course known to all of you that the concentric limitation of the field is a characteristic symptom of optic nerve atrophy, but this man had the symptom more pronounced than I have ever seen it, for he was able to see but a few degrees outside of the line of fixation; in other words he was as though looking through a tube of narrow caliber.

It has been of great interest to me to watch this man during his eight years of treatment as detailed by Dr. Day. As far as I can judge there have been no changes whatever in his eye; central vision still being 20-20 plus, and his field as narrow as is possible. The patient has been unable to differentiate colors from the start.

Simple atrophies of the optic nerve of the kind described in this patient are non-inflammatory in character. Strange to say, the text books on ophthalmology nearly all say that these cases are caused by tabes and paresis. As it is now known that these diseases are nearly all due to syphilis in the advanced stage, I am convinced that in the final analysis we can safely say that simple optic atrophy is due to syphilis, and that the eye condition simply occurs coincidentally with the cerebro-spinal diseases.

B. F. Zimmerman: In closing I wish Dr. Day would give us his opinion concerning the value of intra-spinous introduction of mercury in the treatment of neuro-syphilis. I recall four patients of this kind, all of whom had well-marked gastric crises; two had pronounced ataxia; the third was slightly ataxic; the fourth exhibited no ataxic symptoms.

The one non-ataxic and the one moderately ataxic were markedly benefited, and the gastric crises disappeared, under the intravenous injections of neo-salvarsan. They have had no further gastric crises. One with well-marked ataxia was given neo-salvarsan and salvarsan intravenously with mercury hypodermatically. He was given four or five Swift-Ellis with absolutely no effect on the Wassermann or globulin test. We then changed to intra-spinous injections of mercury. After the third injection the Wassermann became negative and his ataxic symptoms were less marked. He received in all five injections of 1-25 grain each. His ataxia improved but did not entirely disappear. During the last two years

he has been able to work every day. The other case was one in which the Swift-Ellis was not given. Following intra-spinous injections of mercurialized serum he rapidly improved and has remained apparently well.

George H. Day, (closing): Strange as it may seem, there is yet no routine treatment in neurosyphilis; and I am aware of no disease which will tolerate routine management less than syphilis. For example: if two cases apparently identical in every essential respect be treated exactly alike, one may progress favorably, whereas the other will not. Therefore, it is important that each case be carefully studied and if necessary different methods of treatment tried; only in this way can the most effective plan for that particular case be determined. This is one of the features which I attempted to emphasize in my paper.

In my experience, mercurialized serum has been effective in certain cases of neurosyphilis, but in others no benefit seemed to accrue therefrom. This is also true of the Swift-Ellis, intravenous injections, and every method of treatment.

While my experience thus far with the fortified serum of Fordyce has not been very extensive, this seems to me to be the method of choice; it combines the best features of other plans of treatment and I think we are nearer the goal than formerly.

The whole question resolves itself into the fact that we must be constantly on the lookout for syphilis, early diagnosis being most important. After tissue fibers have been destroyed we are aware of no treatment which can restore them. It is paramount that the patient be seen early, that the diagnosis be made promptly, and that treatment be instituted immediately. In the treatment of syphilis anything is better than inactivity, which, in my opinion, is absolutely unpardonable.

KENTUCKY SECTION AMERICAN COLLEGE OF SURGEONS.

The Kentucky Section of the American College of Surgeons will hold their first meeting and clinic in Louisville, March 25-26. Headquarters will be at the Seelbach Hotel. The profession of the State is invited to attend the scientific and public meetings. Admission to the clinics will be by card only.

Spasmophilia and Vitamins.—The evidence presented by von Meysenbug shows that increased electrical irritability—so-called “spasmophilic reactions”—is not dependent on a deficiency in the diet of the water-soluble vitamin or of the other two known food accessory factors.

REPORT OF THE PENDLETON COUNTY HEALTH BOARD.

By H. C. CLARK, Falmouth.

Health Officer Pendleton County.

At the end of December and the close of 1920, my term as Health Officer will expire. It has been my custom to report to the Fiscal Court and the State Board of Health at the end of each year what has been done in the county during the year by the County Health Board in the way of educating the people in sanitation and explaining the State and National Laws under which the Pendleton County Health Board serves.

During the year just closing, your Health Board has been in continuous session until this time, and will remain in session until January 1, 1921, at which time a new board will be appointed to serve two years.

Your Health Officer begs leave to give an itemized statement of his work during the past year. I have visited every portion of the county, had seventy-three dead animals buried, inspected milk, barns, school houses, slaughter houses, butcher shops, creameries, inspected the back yards of every dwelling in Falmouth, had ten warrants issued against citizens of Falmouth for maintaining unsanitary and filthy back yards, all of these people were fined. Two others had their cases referred to the grand jury, the district attorney directed the grand jury to dismiss their cases without a hearing before the court.

I have experienced great opposition in almost every effort made during the year to have things more sanitary and wholesome in the county. Many of the people are as clean as they care to be and same do not object to associate with a house-fly. In fact, they like him as a friend. Notwithstanding that I have been bitterly opposed by some, there are many more friends to sanitation in the county than there was two years ago, and conditions greatly improved. Sickness and death rate reduced. I have examined five hundred and eleven milk cans during the warm months, found but eighty-one perfectly sanitary. I have had the drinking water from thirty-four cisterns in Falmouth examined, eight of which had to be closed permanently, twenty-one treated with lime to destroy the bacteria. There were but five which were not contaminated.

I have had the drinking water from thirty-seven of the school houses in the county analyzed with but four which were not contaminated by surface drainage. The law provides that cisterns must be cemented to the

top and be inclosed completely by concrete top; should be filled during the early spring rains, the lead trough removed or disconnected entirely so that warm water of summer rains would not go in.

Since January 1, 1920, I have made 287 visits in the town and county instructing the people how to keep well. There is but little to be expected from the old sinners against sanitation in the county. They are joined to their idols, set in their ways, but the young have listened and remembered putting into practice many of the rules of the State Health Board.

Below you will find the births and deaths occurring in the county during the year, and see some encouragement for the Board of Health in the improved conditions in Falmouth, Butler and the entire county:

Deaths, 1919	172
Deaths, 1920	144
Births, 1919	207
Births, 1920	282

There were 53 cases of scarlet fever, 29 cases of smallpox, 12 cases of diphtheria in Pendleton county within the year. Quite a large percent of death rate was from preventable causes. And once more I beg of you to remember that one baby in this county out of every ten dies from preventable diseases before the second birthday. Entirely too many children die from neglect in Kentucky.

Whoever succeeds me as Health Officer will find less opposition and more sanitary conditions in the county. I hope the gentlemen comprising the Fiscal Court may be anxious to encourage the good work of life-saving and be ready to pay a respectable salary in 1921.

Subcutaneous Symphyseotomy in Argentina.—Zarate's experience in thirty cases impels him to affirm that subcutaneous symphyseotomy is a simple and mild operation which permits spontaneous delivery and triumphs over dystocia from relatively contracted pelvis. Version and forceps are contraindicated with it and serve only to bring it into disrepute. The contracted pelvis of Argentine women, is almost always of the relatively contracted type. With an obstetric conjugate of 7.5 cm. as the limit, subcutaneous symphyseotomy will in time, he declares, reign supreme over the violent methods.

Immunization Against Diphtheria.—Opitz reports that he was able with dilutions of pure diphtheria toxin, injected intradermally, to induce active immunization against diphtheria as effectually as with Behring's toxin-antitoxin vaccine. The detailed findings are tabulated.

PELLAGRA, WITH REPORT OF CASES.*

By HARRY GAMBLIE STAMBAUGH, Wolfpit.

Pellagra is an acute, sub-acute, and chronic disease of metabolism, due primarily to a deficient dietary, and characterized clinically by a slow insidious onset, with neurasthenia, dermatitis, and diarrhoea.

Hippocrates, the father of medicine, did not mention pellagra. The first definite description is usually credited to Casal, who, in 1735, described the disease as it existed in Asturia. Frapolli, in 1771, named the condition, the derivation being from "Pelle" (skin) and "Agra" (rough). About 1907, pellagra was found to be an important disease of the Southern United States, and since that time the number has so steadily increased that now more than sixty thousand cases have been reported.

This disease is prevalent in Italy, Balkan States, Greece, Turkey, Spain, Portugal Southern United States, Central America and Mexico.

REPORT OF CASES

(Case No. 1. Boy, age eight, Kentucky, (bottle baby); been in poor health for the past three years; has never been able to attend school; complains of general weakness and fatigue; never cared to play or partake of any of the childhood sports. On the slightest exertion, he showed great exhaustion and tremor. Had been treated in Louisville and Lexington for almost all the chronic diseases including tuberculosis, hookworm disease, and the other intestinal parasites. Patient growing rapidly worse. In March of 1918, the boy was carried to my office by his father, who gave me the above history. Examination showed the boy poorly developed and poorly nourished; weight thirty-six pounds; mucous membranes quite pale; fine tremor of tongue and extremities. The tongue was red and fissured, with an increased salivation. There was pain and burning sensation in the stomach, anorexia, nausea and uncontrollable diarrhoea. The skin was dry, hard and rough with epidermal exfoliation. Heart and lungs normal; pulse 100; temperature 99; fecal contents for parasites and bacteria, negative.

A provisional diagnosis of pellagra was made and treatment instituted. In about thirty days, there appeared the third and diagnostically the most important symptom of the disease which consisted of a marked erythema, strikingly symmetrical, sharply delimited, skin lesions of the exposed surfaces of the body, resembling sunburn, which per-

*Read before the Kentucky State Medical Association, Ashland, September, 1919.

sisted instead of fading, with desquamation and exfoliation. After six weeks' treatment with rest in bed, improvement was marked. In eight months, there was an apparent cure, and the patient entered school with a bright mind and rosy cheeks, with a weight of fifty-eight pounds.

Case No. 2. Woman; married; age twenty-four; Tennessee. Lived in mining camp for past ten years. First showed only slight prodromal manifestations of the disease, which rapidly passed into those of an acute type, with violent diarrhoea, nausea and vomiting, high temperature (103 degrees) with profound prostration. This patient showed all the classical skin lesions including the butterfly outline of lupus erythematosus and Casal's necklace. Diagnosis of acute pellagra was at once made and treatment begun. In three months, recovery was apparent and the patient was permitted to return to her native home. Recent information states that she has never had recurrent attacks, but still follows the line of prophylactic and curative treatment.

Case No. 3. Man; age sixty; nativity, Alabama; has lived for the past twenty years in Arkansas, Mississippi, Alabama and Tennessee; occupation, lumberman; has spent most of his life in milling camps where he was forced to live on staple groceries, dried meats, and other forms of preserved food stuffs, with an absence of milk, fruits and fresh vegetables. He states that others in the milling camps had the same disease peculiar to himself. He had been suffering with a diarrhoea and nervous condition for the past seven years. An examination showed pellagra of advanced standing with a marked tendency to mental involvement. After four months of treatment, improvement was very slightly marked, with a continuation of the mental symptoms. After removing to the country where a proper balanced ration was obtained, improvement was rapid and now the man is at work with his brother on the farm, but had a recurrence early in March.

Case No. 4. Woman; married; age thirty; Tennessee. She gave a similar history and results.

Case No. 5. Woman; married; age twenty-six; Kentucky. Only showed the characteristic skin lesions, and moved away before treatment was completed. This was the second appearance of the skin lesions and occurred during the puerperium, but the child showed no signs of pellagra.

Case No. 6. Baby; age three; nativity, Tennessee; reared on condensed milk; son of Case No. 2; only showed a few skin lesions which made their appearance about two months after the mother's attack. A revolu-

tion in diet was all the treatment advised, with favorable results.

ETIOLOGY

The views in this connection are innumerable. Many of the best scientists of the world still believe that the disease is due to, or in some way connected with the ingestion of maize or Indian corn, while on the other side stand men of equal ability who claim that pellagra is an infection. Still after long discussion and scientific research, none have been able to prove their views as to etiology. My conclusion and belief is based on the researches of Dr. Goldberger and his colleagues of the United States Public Health service, who reports the following:

"In an orphan asylum with 211 orphans, sixty-eight or thirty-two per cent had pellagra. These children were divided into three groups and given different rations. Those under six years receiving milk and eggs, while those over twelve were given meat, as they assisted in the work of the institution. The children between six and twelve lived practically on a vegetarian diet in which corn products and syrup preponderated with deficiency in legumes. Of twenty-five young children, only two showed pellagra, with but one case in the sixty-six over twelve, while the 120 between six and twelve gave sixty-five cases or fifty-two per cent."

Many other observations with similar results have been reported by Goldberger. I am, therefore, persuaded to believe pellagra is only a form of starvation.

PATHOLOGY AND MORBID ANATOMY

The following autopsy was performed while in college:

Subject: Male; colored; age sixteen; nativity, Tennessee.

Physical Examination: Fairly well developed, but poorly nourished. Great emaciation; skin dry, rough and atrophic; signs of senility; mucous membrane quite pale.

Heart: Cloudy swelling, fatty degeneration and brown atrophy.

Aorta: Atheromata and arteriosclerosis nodosa.

Lungs: Emphysema and passive congestion.

Stomach: No change.

Liver: Size increased—soft in consistency, fatty degeneration and cloudy swelling.

Ilium and Colon: Greater part showed hyperemia, papilloma and superficial erosions.

Diagnosis: Cause of death, pellagra.

SYMPTOMATOLOGY

The following outline is taken from Stitt, who, to my knowledge, has given the best de-

scription of symptoms yet published. In a typical case with its more or less prolonged prodromal, neurasthenic manifestations, often first noted during the winter months in which muscular fatigue, dizziness, insomnia, apprehension, and occipital heaviness, together with a burning sensation of the mouth, and slight, epigastric discomfort, we have in the ensuing spring months more marked alimentary tract disturbances, consisting of stomatitis, gastric disturbances, especially pyrosis, with a recurrent diarrhoea. About this time, the most characteristic and most easily recognized of the signs of the disease appears as localized, sharply delimited, striking symmetrically skin lesions of certain parts of the body which are chiefly exposed to the sun's rays, and in appearance resembles sunburn although it follows inadequate exposure and persists instead of fading, together with desquamation instead of healing.

The typical eruption, however, is that which shows itself on the back of the hands, or running up beyond the wrist to the lower part of the forearm. On the face, the eruption is most common over the bridge of the nose or the cheeks and forehead. Occasionally, the butterfly outline of lupus erythematosus is seen, or the face may show the pellagrous mask. On the neck, we may have a band-like eruption called Casal's necklace.

In the third and last stage, the nervous symptoms become more distinct in which toxic psychosis, confusional insanity, terminal cachexia and dementia mark the end.

TREATMENT

I. Prophylaxis: (a) A well balanced ration; (b) Pure, fresh foods, rich in vitamins; (c) Avoid staple groceries and vegetarian diet to excess; (d) In the preservation of foods take heed not to destroy the life-giving substances; (e) Insist on mother's milk for babies until they are at least two years old.

II. Curative: At present we have no specific medication. The most essential and paramount therapeutics within our hands consists in a complete revolution in diet, with rest in bed, together with proper sanitary and hygienic surroundings. Of foods, sweet milk in large quantities stands first, with an abundance of fresh eggs, meats, fruits and vegetables. In fact, forced feeding should be the slogan in all the sub-acute and chronic cases. I invariably prescribe a milk diet in all acute febrile cases. Those cases with violent diarrhoea and high temperature are best handled along typhoid lines. For the dermatitis, a bland antiseptic oil dressing covered with a roller bandage usually suffices. For the anemia, the various prepara-

tions of iron and arsenic are recommended. Sodium cacodylate is an efficient drug and well borne. Fowler's solution, to the point of tolerance in ascending and descending doses, alternating with tincture Ferrie chloride, has proven efficacious.

In conclusion, I believe the repetition each spring and fall of the treatment outlined is almost a specific prophylaxis against future attacks.

REFERENCES

Stitt.
Goldberger
Krauss.

DISCUSSION:

E. M. Howard, Harlan: In the first place I would like to compliment Dr. Stambaugh on his excellent paper. I think he covers the ground very thoroughly and intelligently, as well as practically.

I have had considerable experience with pellagra, having seen my first case to recognize it in 1914, and since then having treated and observed between two hundred and three hundred cases of this disease.

Pellagra makes its appearance in many and varied symptoms, and as indicated and suggested in Dr. Stambaugh's paper, necessarily demands treatments for the different symptoms accordingly. And here I want to say that I especially endorse what Dr. Stambaugh has used and recommended in the way of diet. The stomach and intestinal symptoms are very pronounced in the average case, and more so in some cases, and by careful attention to diet with symptomatic medicinal treatment we are able to get results in far more than 50 per cent of the cases. In fact some cases seem to be cured by diet and correcting the stomach and intestinal symptoms.

The nervous and mental symptoms in some cases are likewise prominent and require special attention. These in a general way are treated symptomatic, and as a rule when the nervous and mental symptoms are very pronounced the prognosis is grave in proportion, and they do not yield to treatment very readily, and sometimes if fact they will get worse regardless of care, treatment, diet, and all that can be done.

Arsenic has seemed to be of more benefit to most cases than all other treatment. For a long time I used sodium cacodylate and thought it cured a lot of cases, but then they began to come back and I found they were not well. In fact some cases do not improve at all with this treatment. Lately I have been using salvarsan or neo-salvarsan and find it is the best of all treatments I have tried. Have not seen a case that did not get better from its administration.

I think the average case should have at least three doses of salvarsan or neo-salvarsan, at intervals varying according to the condition of the

patient and the symptoms of the disease present. The dosage also to be governed by the condition, weight, etc., of the individual patient. In most cases I believe it best to repeat the dose early, which I have done without any bad results, but with marked improvement. I give the average patient 0.6 gramme neo-salvarsan or 0.4 gramme salvarsan.

Z. A. Thompson, Pikeville: I was intensely interested in Dr. Stambaugh's paper. I understood him to say that it is his opinion that the etiology of pellagra is due to starvation. It is claimed by the best authors that pellagra is frequently developed in the best of families. I have seen several cases of pellagra in my county that I have been called upon to treat, and the majority of them died. I was fortunate to get some of them into the asylum before they did die.

Arthur T. McCormack, Louisville: This is one of the most interesting papers read at this meeting, from a public health standpoint, as well as from the point of view of a finished paper, and the completeness with which the subject was covered. It is a splendid paper, covering everything we know about the subject of pellagra and some of the things we are a little doubtful about.

Pellagra is a disease not caused by insufficient diet, but develops in individuals who have an insufficient diet. I do not believe we exactly express what we mean in beri-beri when we say it is caused by the patient's diet. Those who get only polished rice do not get certain vitamins that are essential in the building up of those protective substances that will prevent the development of beri-beri. Those who do not have pellagra subsist on a certain combination of food and we cannot tell yet what that combination is exactly, although we think it must, as the doctor has so well said, include milk or fresh meat, one or the other, and preferably both. As Goldberger well expressed it, so many people eat too much meat, especially the people who live in cities and communities where meat is the easiest thing to cook. A larger proportion of country people get very little fresh meat. From an economic standpoint, milk is the cheapest food in the world. The high cost of living has made meat and many things hard to get. But milk is the cheapest food obtainable and a cow properly fed means that the family do not get pellagra. Cows in Harlan County coal camps that live on a combination of coal dust and other such things do not give milk that protects against pellagra. A cow must have food—such as hay, bran and meal in order to have in the milk the protective substances that prevent pellagra.

The subject of prevention of pellagra is a much broader one than the mere prevention of the disease itself, because if we get our population not to depend upon corn bread and molasses, not to live on that as a regular diet, but to live on beans and the other things so frequently and easily

found in the country districts, and restrict their diet, we will finally prevent pellagra. But we have to build these patients up so they are not apt to have tuberculosis or succumb to acute diseases, because they have better resisting power. It is necessary to go back when we make a special study of any disease, whether it be tuberculosis or pellagra, and get down to bedrock principles. The greatest study of mankind is man, and if we put him in the right sort of environment he will not have pellagra nor many other things. The underlying principles of the doctor's paper, if carried out, will prevent almost all the chronic diseases in this state.

Another very interesting and important point that the doctor makes, and I disagree with Dr. Howard, is that there is no specific medication for pellagra. Medicine has no effect on pellagra: neither neo-salvarsan or salvarsan or any other medicine. The only thing we can do with medicinal treatment is to combat the accompanying anemia or other complications. In these cases, Dr. Howard, many of the arsenical preparations will help to overcome the anemia, when properly used. The great majority of cases of pellagra in Kentucky are complicated by hookworm disease or other intestinal parasites. If you can get these cases at the beginning and find the intestinal parasites and get rid of them, you will cure them. Give the diet a chance to get into the patients. If patients are able to overcome pellagra itself it is because they are given a mixed diet, and for no other reason. They are helped by the use of such remedial agents as adjuvants for the complications that we want to overcome, always using them with the idea of building up the resistance of the patient.

I regret very much this paper came last on the program. If I could do one thing for the members of the medical profession of this state and get into their heads the importance of knowing this subject as Dr. Stambaugh knows it, and like every one of you know it, and come here and tell us in the same convincing tone he did and say it loud and talk like the men you are and say these things that way, the medical profession of Kentucky will continue to do what it did when McDowell and Gross and our great forefathers led the profession out of darkness. The thing for us to do is to carry the banner and tell them the things we know plainly and scientifically, like Dr. Stambaugh has done. (Applause.)

H. G. Stambaugh, (closing): In conclusion I wish to emphasize the point brought out by Dr. Thompson, that pellagra may be found among the rich as well as the poor. A man may die with some disease of metabolism with plenty in store.

With reference to corn bread and molasses, mentioned by Dr. Lane, I do not consider them etiological factors in producing the disease when consumed in reasonable amounts. Any menu,

poor in vitamins and variety, continued for long periods of time, together with improper sanitary and hygienic surroundings, is a dangerous thing and may lead to pellagra.

Concerning the treatment mentioned by Dr. Howard, and with all respect to his method of administering arsenic, I believe that Fowler's solution is the drug of choice, as it is less dangerous, more easily administered in rural practice, less expensive, and give better results than salvarsan or neo-salvarsan.

In conclusion, permit me to thank you for this closing our of our meeting. I am indeed grateful for this, my first effort and opportunity of addressing you. If I am wrong in my views, please lead me to see the light. If I am right, then will you become disciples that you may help us to save others.

THE DOCTOR OF TO-DAY.*

By W. R. BURR, Auburn

The first quarter of the twentieth century has brought about many changes in medicine and surgery, notably in preventive medicine and reconstructive surgery.

But while the doctor of today differs in many respects from the physician of the old school he is not altogether different in type. Most of the modern disciples of Aesculapius show some of the characteristics of his followers of yesterday.

In "sizing up," if I may be allowed the expression, the doctor of today it may not be amiss to compare him with those of bygone days.

I recall one who to my mind, was of the great men of our profession, an old-fashioned family doctor of the William MacLure kind, who went to his reward, which I am sure was a rich one, a little more than two decades ago. He had not become famous, as the world reckons fame, and there was not much to do over the passing of the grand old man, but there were many sorrowing hearts among those who had known him and had been the recipients of his kindly ministrations.

He was to me a benediction and an inspiration, my ideal of the true and useful general practitioner of the art of healing. "He was a man that take him for all in all, I shall not look upon his like again."

He practiced his profession in my country for nearly three-score years and traveled more miles upon horseback, I dare say, than any other man who has ever followed the calling to which he devoted his life.

Starting upon his professional career with a very limited preliminary education, by dint

of constant study and close application to his duties he became remarkable for his broad culture and medical skill.

In all the years of his service he was busy with the abundant work his hands found to do, and the weather was never too severe nor the nights too dark to keep him from responding to calls that came to him from his suffering and distressed fellow creatures.

He grew old gracefully and was a notable example of a life well spent, the sunset of which was beautiful and serene. So blameless was his life and so filled was it with that greatest of all virtues, charity, and so courageous of soul had he awlays been, that when the end of his earthly existence came, he met the summon, "not like the quarry slave, scourged to his dungeon, but like one who wraps the drapery of his couch about him and lies down to pleasant dreams.

I would rather leave behind me "at the end of life's little span," a record such as he made than one for having founded as many libraries as Andrew Carnegie established or for having given as much to educational endowment as has John D. Rockefeller.

Better than storied urn or animated bust is it to have said of one when "life's fitful fever" has ended that, like Abou Ben Adhem, loved his fellow man and gave himself to his service.

Is there a grander, more noble character than that of the kind-hearted, successful family doctor, ready and willing to minister to suffering humanity, day or night, and to brave all kinds of hardships, privation and danger of infection and contagion, that he may alleviate or lighten the pains and heartaches of those who pin their faith to him?

He becomes firmly intrenched in the hearts of those he serves, if they are "made of the right kind of stuff" and they learn to regard him as their "friend, philosopher and guide," and while they may deem other and more modernly equipped physicians as possessing greater skill, by reason of more training in laboratory methods and much practice with surgical appliances, they have an abiding confidence in his advice and judgment in all things pertaining to their physical welfare.

The physician of the old school who has given his entire time and talent to his calling and who is wholly devoted to his life work, who has kept pace with the progress of his cause, "trying all things and holding fast to that which is good," commands my highest admiration and respect and I have no sort of patience with the Osler idea that such men, when they have reached the "sere and yellow leaf" period, should be eased out of existence.

There is too much of a tendency on the

*Read before the Logan County Medical Society.

part of the dapper young doctors of the day, who have had the advantages of higher education, to want to relegate the older members of the profession to the rear and class them as old fogies and "out of date," when they might profit greatly by hunting them up and sitting at their feet, as did St. Paul at the feet of Gamaliel, that they might learn wisdom.

The pendulum has swung too far, I fear, from old theories and practices toward modern fads and new-fangled methods. There are, I dare say, too many new things under the sun in the realm of healing, such as chiropractic, osteopathy, vacuum cleaners, interstitial gland transplantation and the like and I fear we have cast aside much that is good in our eagerness to progress.

But do not understand me that I deery the spirit of advancement that has animated our profession and spurred it on to grand achievements; I am only entering a mild protest against the tendency of some of the doctors of today to hold nothing as good that is not new. "Not all is gold that glitters," and not all that bears the label of the last tick of the watch in medicine and surgery is worth while.

The day has passed, to be sure when a doctor can afford to approach the bedside of the sick and snap his diagnosis; when he can feel the patient's pulse, take his temperature look at his tongue, palpate, percuss and auscultate him; decide what ails him, without further investigation, and make out a course of medicine and a bill of fare for him.

Time was when hasty, perfunctory examinations of the sick or injured, haphazard diagnoses and routine treatment were tolerated by the laity, but, nowadays, a higher standard of efficiency is demanded of the doctor, and it should be, by those who have to seek aid for their ills.

The doctor of today, unless the diagnosis of a case that may be placed in his hands is plain and patent, should be able to employ or have employed the latest laboratory methods in order that the true state of affairs may be ascertained and the patient given every possible chance of recovery or of having his troubles alleviated.

In what I shall have further to say concerning the doctor of today, that is of some types of the physician of today, it may be that I shall tread upon some tender toes, (including my own,) for I am fully aware of the fact that I have numerous faults, some of them very glaring. I am not going to throw stones, pretending that I do not live in a glass house, nor do I wish to make the impression that I am guiltless of some of the indictments I may draw against my fellows.

I hold that medical societies should not be

considered "mutual admiration" affairs, in which nothing should be said that smacks of criticism. Finding notes in the eyes of our fellows, while serenely and blissfully ignorant of the beams that may be in our own optics, is reprehensible, but criticism given in the right spirit should always be permissible.

There are physicians and physicians; in the present era, and many false doctrines are being foisted upon (the laity. They, the laity, are wiser in this than in former generations, but many of them still "fall" for the fakers who brazenly presume to practice the healing art and who follow the calling for revenue only.

We have today as we have always had, the incompetent, unprogressive general practitioner, with whom medicine is only one of a number of accomplishments; and to use a hackneyed quotation, "May angels and ministers of grace defend us," and the laity from him.

He belongs to the class that "never would be missed," or rather to one that would be pleasantly and profitably missed. Usually of faulty preliminary education and barely enough medical knowledge to have enabled him to squeeze through the ordeal of the "Green Room," he has had no ambition to make any educational or professional advancement. He never reads a text book and is innocent of keeping up with current medical literature and never attends medical society meetings, if he can help himself.

The practice of medicine is to him a side issue, and he debases it to a commercial level for that very reason. What boots it to him that the dignity and rewards of the profession should be kept at a high standard? He is to deficient in ability to command good prices for his professional services, and keeps other "irons in the fire" to satisfy his greed for gain.

The fate of his victims is of little concern to him; and his fellow doctors receive no consideration at his hands. He is a spectacle for Gods and men to turn from in pity and contempt.

And then we have the well-educated, capable physician who lowers the dignity of the profession and subjects it to reproach by putting it on the plane of ward politics; who works every wire to get practice, and whose motto is "Put money in thy purse," his burning desire being to gain prominence, whether it be by fair means or by foul, and who does not scruple to have his trumpeters posted on the street corners and along the highways to sound his praises of the greatest healer in the land. He scruples not to work esoteric society relations, political affiliations and reli-

gious associations to further his work. Nor does he balk at filching the good name of his fellow practitioner, robbing of that which not enriches him, if he only knew it, but makes his brother poor indeed.

None of his associate physicians ever has a case that he has not had a number of similar ones, and he is ready to dilate on the marked success with which he handled them. He has the art of advertising reduced to a science and "for ways that are dark and tricks that are vain; like the heathern Chinee."

One of this type of physician of today can be found in nearly every community; but of course none of them belongs to any of the societies represented at this meeting.

Another variety of physician, quite numerous today is the ultra-educated specialist, who from his great eminence, looks down upon the country physician to lift the gloom of ignorance he supposes hangs like a pall over the smaller medical societies.

He is constantly advertising himself in the association journals by contributions that are grand, gloomy and peculiar, and that are pregnant with theory and complications, and provokingly barren of anything practical to those who must cope with disease in its manifold phases.

Dr. G. Frank Lydston once said: "On looking over the menu card presented by the Most High, (meaning the Journal of the American Medical Association) we find such things as "My Last Thousand Cases of Excision of the Calamus Scriptus;" "My Postural Method of Catherizing the Iter a Tertio and Quartum Ventricle;" "The Opsonic Index in the Care of the Second Bicuspid," etc.

Then there is the medical editor of today, of the so-called high class medical journals, who is inclined to give us too much theory and scientific mash to feed upon, and to consign practical articles, of pith and moment to us in our every-day work to the capacious maw of the waste basket, that these articles from the elect, on subjects we may never have occasion to deal with, may have space.

And quite a number of the "holier than thou" medical journals are like Mark Twain's frog, bound to earth by what they have swallowed, with nothing original and worth while to the general practitioner in them; and the pabulum they dish out to us is about as satisfying to our mental hunger as eating soup with a fork would be to one physically hungry.

Quoting Dr. Lydston again, "Medicine is fast becoming so scientific, so turgid with the things that ain't so or which at least are 'under suspicion' that the main purpose of

medicine, the healing of the sick, bids fair to be lost in the maze of laboratory experimentation," I trust the case is not as bad as he has drawn it; still there is a deal of truth in what he has said.

But about the most despicable type of the present day doctor is the one who works the expert testimony graft, the alienist, who stoops to perjury for a price and who would hoodwink the public into the belief that he has had such exact training and possesses such psychological insight that he is enabled to decide with accuracy whether or not a murderer or a thief was under the influence of a "brain storm" or was afflicted with "dementia Americana" when the crime was committed. And it is a lamentable fact that these mental pretexts are not without their influence on American juries.

I might mention several other classes of the modern doctor, for as I have said, there is a variety of kinds but if I did this paper, perhaps already too long, would be drawn out to a length that would be wearisome, indeed. So I shall mention but one other kind, the "salt of the earth," who bless humanity by passage through the world.

To this class, of the physicians of today, belongs the man who is an edition deluxe of the old school doctor, the one who holds to the best traditions of medicine, who maintains in his bearing the old-fashioned dignity of his profession; who keeps in mind the Hippocratic oath and holds sacred its precepts; who stands by the code of ethics; who invests in and reads the latest and best text books and medical journals; who is given to study and close observation; who is ever ready to do the very best thing his judgment dictates, regardless of precedent or pathy, for his patients; who, even has the boldness and impudence to run counter to the ban of the Council of Pharmacy or to fly in the face of the "captious criticisms" of the "powers that be," should occasion demand it, and who does not allow his mind to become trained with the false doctrine of therapeutic nihilism and will not suffer himself to be led off by pessimistic prophets who would preach that there is "no balm in Gilead."

Such a man when in addition to his professional qualifications, he has a breast full of the "milk of human kindness," and considers charity the cardinal virtue, constitutes the ideal modern physician.

If the profession is to be saved from commercialism and the taints of practical politics; if the dignity of our profession is to be upheld and the character of the true physician is to be perpetuated, the family doctor, with his whole life devoted to his calling and

to the molding of opinions among his clientele, always a student and close observer, his heart attuned to the call of suffering or distressed humanity and filled with sympathy, must prove to be the saving grace.

And I believe that, notwithstanding the world of today is permeated with selfishness, and specialism is rife in the land, the family doctor, the true physician will never become obsolete.

I am optimistic, too, as to the future of our profession. The science of medicine has a glorious, an honorable past; the present is rich with its achievements; and its future is bright with the prospects of accomplishment.

I am not optimistic to the degree that I believe the science and art of healing will reach the point of perfection that may enable us to escape the curse of Eden; but I am hopeful that the day will come when preventive and curative medicine will have robbed the "Great White Plague" of its horrors; as they have shorn smallpox and diphtheria of their horrors; when there will be successful inoculation against all acute affections, as is the case against typhoid fever; when the germ causing cancer will have been isolated and a cure for the dreadful malady found; when other diseases now deemed incurable will have been brought under subjection; and it will be inexcusable for anyone to "shuffle off his mortal coil," except as the "Deacon's one hoss shay" went out of existence, which as the great doctor poet put it,

"All at once and nothing first,

Just as bubbles do when they burst."

THE SCHICK REACTION*

By W. Z. JACKSON, Bardwell

The Schick reaction is a convenient and reliable clinical test by which the antitoxic immunity of an individual to diphtheria can be determined. A fresh solution of diphtheria toxing is prepared for this purpose. A good guide for the insertion of the needle into the proper layer of the skin is to be able to see the oval opening of the needle through the superficial layers of the epidermis. A properly made injection is recognized by a distinct wheal-like elevation, which shows the prominent openings of the hair follicles. The result of the test should be read at the end of 24, 48, 72 and 96 hours.

The reaction that appears at the site of injection may be either positive, negative, pseudo, or combined positive and pseudo.

The positive reaction represents the action

of an irritant toxin upon tissue cells that are not protected by anti-toxin.

It indicates, therefore, an absence of immunity to diphtheria.

A trace of redness appears slowly at the site of injection in from 12 to 24 hours, and usually a distinct reaction in the course of 24 to 48 hours. The reaction reaches its height on the third or fourth day, and gradually disappears, leaving a definitely circumscribed sealing area of brownish pigmentation which persists for three to six weeks.

At its height the positive reaction consists of a circumscribed area of redness and slight infiltration, which measures from 1 to 2 cm. in diameter. The degree of redness and infiltration varies to a great extent with the relative susceptibility of the individual. The positive reaction is seen in about 7 to 10 per cent of the new-born, 30 per cent during the first year of life, 35 decreasing to 15 per cent between 2 and 14 years, and 10 per cent of adults.

In the negative reaction the skin at site of injection remains normal. The negative reaction definitely indicates an immunity to diphtheria if the test-toxin is of full strength, has been freshly diluted, and the injection has been made into the proper layer of the skin. A negative reaction obtained in a child that has reached the age of three years indicates that it has immunity which is probably permanent. Of 1,000 carefully observed individuals not one developed clinical diphtheria, even though they were exposed to the disease, and some were carriers of virulent diphtheria bacilli.

The pseudo-reaction represents a local anaphylactic response of the tissue cells to the protein substance of the autolyzed diphtheria bacilla, which is present in toxic broth used for the test. Like other anaphylactic skin phenomena, the reaction is of an artificial nature, appears early, within 6 to 18 hours, reaches its height in 36 to 48 hours, and disappears on the third or fourth day, leaving a poorly defined small area of brownish pigmentation and generally no sealing.

Individuals who give a pseudo-reaction are immune to diphtheria.

The combined reaction represents the positive and the pseudo-reaction in the same individual. The central area of redness is large and better defined, the amount of infiltration is also more marked. The reaction is recognized by noting the evidence of a true reaction, a definitive area of sealing brownish pigmentation after the pseudo element has disappeared in the test. In addition, a similar though weaker reaction is obtained in a control test made by heated toxin. The control represents only pseudo reaction. The

*Read before the Carlisle County Medical Society.

combined reaction indicates an absence of immunity to diphtheria.

The Schick test is of practical value in determining the immunity to diphtheria of the public in general, but especially of the child population in school, hospitals, institutions, and in homes during an outbreak of diphtheria.

It will save a considerable amount of antitoxin and avoid unnecessary sensitization of more than 65 per cent of the exposed individuals.

The test is also of distinct value in the active immunization of susceptible individuals against diphtheria with mixtures of toxin-antitoxin, and the diagnosis of clinically doubtful cases of diphtheria.

As supplied by most manufacturers, the Schick test outfit consists of a tube of diphtheria toxin and a vial containing a measured amount of sterile salt solution. By mixing the contents of the capillary tube with the saline a solution is obtained which is ready to be injected into the skin.

The following is the text of directions given:

Break off one end of the capillary tube, push the broken end carefully through the neck of the rubber bulb until it punctures the diaphragm within and enters the cavity of the bulb; then break off the other end of the tube. Hold the bulb between the thumb and middle finger, place the index finger over the opening in the larger end of the bulb and expel the toxin into the 10 c.c. of saline. Rinse out the capillary tube by drawing up the saline several times, then cork the bottle and shake the diluted toxin. Inject 0.1 c.c. or 0.2 c.c. in the flexor surface of the forearm or arm. The contents of the bottle are sufficient for about 35 tests. On account of the fairly rapid deterioration, it is not advisable to use the diluted toxin after 12 to 24 hours. The outfit must be kept very cold to prevent deterioration.

ACTIVE IMMUNIZATION

After discovering susceptible individuals by means of the Schick test, the question at once arises as to the best method of immunizing these individuals. The protection afforded by injections of diphtheria antitoxin is of very short duration, three or four weeks being the usual period. Far more lasting is the protection afforded by active immunization. During the past three years, Park and his co-workers have employed active immunization with toxin-antitoxin, mixtures in the case of over 4,000 susceptibles (including 1,000 infants under one week old,) without the subsequent occurrence of a single case of diphtheria. Park summarizes his observa-

tion as to the value of this active immunization as follows: The procedure is absolutely harmless. No reaction develops in infants, while in older children and adults a moderate swelling of the arm may appear and last for from one to three days. One injection gives immunity to 80 per cent of those previously susceptible; two injections gives immunity to 90 per cent and three injections to 97 per cent.

The immunity conferred last for at least three years and probably much longer. No diphtheria has occurred in those so far immunized.

In order to facilitate active immunization by practicing physicians, several establishments making biological products put up small vials containing a mixture of diphtheria-toxin-antitoxin. This mixture is used diluted. The dose is 1 c.c. injected subcutaneously in the arm at the insertion of the deltoid. The injection is repeated at weekly intervals until three injections have been given. For children under one year of age the dose is 0.5 c.c. In younger children the local and constitutional symptoms following the injections of toxin-antitoxin are much less marked than in older children and adults. The difference is due to a greater susceptibility of the older children to the diphtheria bacillus protein, which is present in the mixture of toxin-antitoxin.

DETERMINING EFFECT OF ACTIVE IMMUNIZATION

The development of an active immunity is determined at the end of three months by means of the Schick test. It has been found that the development of anti-toxin in many individuals is often a slow process requiring from eight to twelve weeks before a sufficient amount is produced to inhibit the Schick reaction.

The number of successfully immunized individuals who will show a negative Schick retest after three injections of toxin-antitoxin will be, in different groups, from 90 to 99 per cent.

Indications for active immunization with toxin-antitoxin.

The use of toxin-antitoxin for active immunization may be considered under two heads:

1. As a general prophylactic measure—The most suitable age period for testing and immunizing is between six months and two years.

At this time of life the percentage of positive Schick reaction is largest and the susceptibility to diphtheria as well as the mortality from the disease is greatest.

2. To control an outbreak of diphtheria—As the immunity arising from an injection

of toxin-antitoxin does not develop until the lapse of from two to twelve weeks, active immunization can not be utilized to protect persons from exposure within that period. Toxin-antitoxin immunization should not be used with antitoxin immunization in the same individual, as the surplus antitoxin tends to prevent the development of an active immunity.

FIBROMA OF THE NASO PHARYNX*

By GAYLORD C. HALL, Louisville.

True fibroma are rare tumors. They spring from the dense fibrous tissue covering the nasal process of the occipital bone, the foramen, lacerum medium, the under surface of the sphenoid, the first cervical vertebra, or the sphenopalatine recess.

The tumors are hard and dense in structure, the so-called fibroma durum. They have an abundant blood supply; they tend toward rapid growth; they form attachments to structures pressed upon and may even invade and necrose tissue. While they are non-malignant in that they do not form metastases they are dangerous to life because they grow adjacent to many important structures which they may invade and they are subject to recurrent hemorrhages.

The vast majority of these growths occur in males between the ages of ten and twenty-five years. After this period the growths seem to diminish in size, lose the blood supply and shrink away.

Histologically these tumors are composed of dense fibrous tissue with elastic fibers intermingled. Cellular structure is not abundant in the mature portions of the tumor though there are frequent nests of cells in the new formed tissue at the edges. Here the growths resemble fibro sarcoma. Blood vessels are frequent and often of large size.

The symptoms occasioned by these tumors are first nasal obstruction with the peculiar facies and muffled voice characteristics of this condition. With the growth of the tumor complete nasal obstruction ensues damming back the secretion which becomes foul through inability to cleanse the nostril. Headaches are frequent and earache not uncommon. Finally deformities of the nose and face take place through extension of the growth and the general condition of the patient is often seriously affected by the recurrent hemorrhages which induce a severe secondary anemia.

The diagnosis is made by examination of the nose and naso-pharynx. The growth may extend below the palate and in this case the

inspection through the mouth reveals the tumor. If not the use of the mirror will show a red or pinkish glistening tumor occupying the naso-pharynx often with vessels running over the surface.

Examination of the nasopharynx with the finger palpates a firm, hard mass. Such examination may induce considerable hemorrhage.

The exact attachments of the tumor are difficult to determine and in fact the true fibroma are sessile.

The differential diagnosis. True fibroma should be distinguished from the fibrous polyp which is pedunculated, does not tend to bleed or tend to grow rapidly, or attach itself to structures pressed upon.

From the sarcoma these tumors are distinguished by histological examination and the lessened tendency to recurrence after removal though it must not be forgotten that the true fibroma sometimes shows a tendency to recurrence, especially so in case of incomplete removal.

The treatment of these cases is purely surgical and may be divided into conservative and radical. Under conservative treatment we classify x-ray, injection into the tumor of tri-chlor-acetic acid, radium, galvano cautery puncture, electrolysis.

Radical treatment. Radical treatment in the older days consisted of splitting the nose or the palate or even resection of the superior maxilla and attacking the growth in this manner.

Dieffenback states that great courage is required to undertake this (old operation) because the surgeon is almost compelled to choose between one or three conditions. The choking to death of the patient during the operation; the bleeding to death at the time of the operation or as a result of tearing or cutting the growth out or finally not finishing the operation.

Other radical measures consist in avulsion of the growth and removal by a snare either hot or cold.

My own experience coupled with the results of operations which I have been able to find in literature during the past twelve years leads me to believe that revulsion possesses advantages over any of the other methods. First it removes the growth in its entirety; second, it is accompanied by much less bleeding, and third, it reduces the chance of recurrence to a minimum.

The intranasal methods practiced at the present day carry a mortality of about five per cent and but few recurrences.

Dr. Devalan states that the old operation resulted in 59.25 per cent cures; a 25 per

*Read before the Jefferson County Medical Society.

cent mortality and recurrence in 15 per cent of the cases.

The following cases as reported in the literature since 1907 are of interest in showing the seriousness and extent of the growths and the magnitude of the operative procedures necessary in certain cases. In 1907 Braden Kyle reports a young man twenty-four years of age with a pedunculated growth in the right nostril extending into the naso-pharynx.

He had blocking of the nostril and pain but no ear symptoms or headache. The growth sprung from the under surface of the superior turbinate and pushed the septum to one side. Was removed with a snare.

C. Jackson, *Journal of the A. M. A.*, (2-17-06) reports a boy fourteen with a hard tumor in the right nostril. Symptoms were headache, earache, stopped up nose, severe hemorrhages, dysphagia, dyspnea, and bulging of the right maxilla. The velum palati was pushed forward and he had diplopia and exophthalmos.

The tumor was removed with a snare after ligation of the external carotid artery and preliminary tracheotomy.

Swain, in September, 1909 *Annals*, reports a case of sloughing fibroma in a boy thirteen years old who suffered with repeated recurrence of the growth. This would swell and slough followed by hemorrhages that were exsanguinating. Attempts at radical removal had to be abandoned. Ignipuncture, electrolysis, x-ray, injections of tri-chlor-acetic acid were all unavailing. After several years the growth became quiescent and shrunk with great deformity of the nasal chambers.

Chamberlain reports four cases in a paper read at the meeting of the American Laryngological Society in 1911. They were operated on by combined avulsion and piece meal cutting method. Two cases had severe hemorrhage; one of them in spite of the preliminary ligation of the external carotid artery. All were operated on under general anaesthesia using the White head gag and Trendelenberg position.

In the discussion of this paper various methods were advocated, notably the injection of tri-chlor-acetic acid. The difficulties of removal with a snare were emphasized.

Stucky used Brandegee forceps, grasping the tumor firmly and separating the attachments by rocking. Before extraction he puts a string through the nostril and ties thereon a large tampon for immediate use should hemorrhage prove severe.

Joseph S. Gibbs, reporting a case in the *Annals of Otology*, June, 1911, says, "Perhaps in no other condition in this region are the demands for early diagnosis more urgent.

The removal of the growth in the early stages is not so serious while we all know the great difficulty and unparalleled dangers that attend the removal of growths by surgical means when they have formed deep-seated attachments and thrown out prolongations into the nasal chambers."

The patient, sex not given, age thirteen years had a large growth filling the naso-pharynx. The growth bled easily. It was removed under ether with preliminary tracheotomy by avulsion with forceps and finger without notable hemorrhage.

He makes a plea for early diagnosis and favors avulsion as a method of removal, noting that hemorrhage is less when the growth is completely removed. Both are points of considerable value.

He mentions the work of Doyen who by special raspatories accomplishes complete and rapid separation of the growth from its periosteal attachments.

In the *Annals of Otology*, December, 1914, Brown, of Columbus, Ohio, reports two cases removed under ether by avulsion. The first case was easily removed with but little hemorrhage. The second case had extension into the cheek and was attached through the antrum with profuse hemorrhage, the growth being finally removed. There was recurrence in this case with repeated severe hemorrhage.

The pathological reports made no suggestion of malignancy. The cases were both males, age seventeen and eighteen years.

In December, 1915, Dr. Delavan advocates the use of radium in attacking these growths. This was made at the meeting of the American Laryngological Society. Neither he nor the other members taking part in the discussion seemed to have much experience with this method.

In a candidate thesis for the American Laryngological Association in 1917, Dr. G. M. Coates, of Philadelphia, makes the point that these growths may be multiple, reporting a case in support of that contention. The patient was a boy age fifteen: One tumor in the right nasal cavity, the other in the naso-pharynx. The tumors were removed by avulsion after failure with a heavy snare. He was not able to find another similar case in the literature. He summarizes as follows:

"The interest in this case seems to lie, first in the presence of more than one growth; secondly, the typical shape, position and attachment of each growth; thirdly, in the difficulty of removal by the cold snare, but the facility with which they were removed by avulsion; fourthly, the apparent completeness of removal, and lastly, in the almost entire absence of

shock or hemorrhage, despite the rough manipulations."

The two cases following have come under my observation during the past year:

Case 1.—L. E. C., age 19 years, St. Matthew, Ky. Patient came on account of nasal hemorrhage. This had been bleeding intermittently for several days. He gave a history of having had an operation on the left side of his nose eight months previously with removal of a growth. This was accompanied by considerable bleeding. At this time the patient's temperature was 100 and pulse 96.

Examination with a mirror shows a large flat growth filling the naso-pharynx but seeming to grow from the left side. The nasal bleeding was controlled and the patient was given a purgative with calcium chloride internally for four days. Returning after that time we removed the growth with but little hemorrhage.

It was attached over the vault of the pharynx, back of the septum and deep into the spheno palatine groove.

The tumor was removed under cocaine by avulsion with the finger through the mouth and forceps through the nose. An attempt was first made to cut this tumor through with a heavy tonsil snare but was unsuccessful. Patient was kept in the hospital twenty-four hours after which he returned home. There was no further trouble nor has there been any evidence of recurrence.

Histological examination shows the tumor to be composed of dense fibrous tissue with some elastic tissue; the vessels are moderate in size and have well-defined walls.

Case 2.—P. G., age 16 years, Rowletts, Ky. Patient has typical facies of the confirmed mouth breather. History shows that he has had difficulty in breathing for one year. By great effort he can suck air through the nostril but can not expel it. Thinks the trouble followed an attack of influenza. General health is good. He has had no hemorrhages.

Examination shows large egg-shaped tumor in the naso-pharynx. Fills both sides but is attached principally on the left side at the upper, outer posterior nasal wall. Patient has also very large tonsils.

After applying cocaine to the naso-pharynx and through the anterior nares this growth was easily removed with the finger through the mouth. It had a rather long pedicle and came out easily. There was no bleeding. Several days later this boy's tonsils and adenoids were removed. It is noteworthy that he had considerable adenoid tissue notwithstanding the presence of this tumor in the naso-pharynx.

The histological examination shows that

the tumor is of the same character as the first case, being composed of dense fibrous tissue.

This, however, is an example of the fibrous polyp rather than the sessile fibroma.

DISCUSSION:

S. G. Dabney: Fibrous polypi and true fibromata are entirely different growths, the latter being more rare than the former. Fibromata have been thought to have a tendency to develop into sarcomata. In my opinion, however, benign growths of this type do not become malignant, but they are exceedingly prone to recur. Braden Kyle's case of fibroma, mentioned by Dr. Hall, occurring in a patient aged twenty-four years is very unusual. It is one of the curiosities in medicine that if these patients can be kept alive until they are twenty-five years old the tumors will disappear spontaneously.

I was interested in the method described by Dr. Hall in removing these tumors from the nasopharynx, i. e., by avulsion using forceps and the fingers inserted through the nose and nasopharynx. I do not recall that he mentioned the electro-cautery snare. That is an old method but a very good one in my judgment.

Fibro-mucous polypi of the nasopharynx are not very rare. I have seen a number of cases of that character. One of the most remarkable was a boy referred to me by Dr. W. C. Dugan many years ago. The patient was greatly emaciated and in serious physical condition which the mother said was due to the fact that he had vomited almost everything he had eaten during the last two years. When he vomited this fibro-mucous polyp appeared in his mouth and presented the typical appearance of a supernumerary tongue; that is exactly what I thought it was on first observation. The polyp reached down from the nasopharynx to the esophagus and caused constant vomiting which accounted for the patient's weakness and exhaustion. It was removed by the electro-cautery snare and the patient made a satisfactory recovery.

G. C. Hall, (closing): Fibrous polypi of the nasopharynx are of two varieties: (1) the solid polypi which sometimes undergoes fibroid degeneration, and (2) the cystic polyp. Both these types are pedunculated. On the contrary, the true fibromata are sessile and attach themselves to all structures they press upon.

It is impossible to completely remove nasopharyngeal fibromata with a snare; portions of the growth are always left which accounts for the frequency of recurrence. Removal by avulsion as described in the paper is much superior to the snare either hot or cold. While the hot snare has the advantage of searing the tissues and thereby controlling hemorrhage to a certain extent, yet all the growth cannot be removed and recurrence is rendered more likely. The principal reason serious hemorrhage has

been reported in attempting removal of nasopharyngeal fibromata is because the snare has been used. Portions of the tumor are left, retraction of the vessels is prevented, and bleeding occurs. The avulsion method is free from that objection because the growth is torn from its attachments by forceps and the fingers, the blood vessels are permitted to retract, and hemorrhage is thus prevented.

Fibromata of the nasopharynx do not degenerate and recur as sarcomata, they invariably recur as true fibromata.

PROLAPSE OF CORD COMPLICATING LABOR. REPORT OF TWO CASES*

By J. W. FITCH, Louisville.

Mrs. G., aged 41 years. Previous history: Mother of five children, two living. The patient gave the history of retained placenta and infection following several previous confinements; leucorrhea and cystitis for the last year.

I was first called to see the patient when she was about five months advanced in utero gestation. She was then complaining of continuous severe backache. Upon vaginal examination I found the pregnant uterus completely retroverted and freely movable. She was placed in the knee-chest position and I succeeded in restoring the uterus to its normal position. Her backache was entirely relieved, and she went on to full term without further trouble.

When called to attend her in confinement examination showed that the cervix was completely dilated, the membranes ruptured, the head engaged, and a prolapse of the umbilical cord. The cord was pulsating. I was unable to replace the cord above the head. Consultation was obtained, and as the head was well engaged and the pelvis seemed to be roomy, we decided to give pituitrin rather than attempt podalic version or apply forceps.

After the injection of pituitrin the labor was very rapid and the baby was born within five minutes. We were unable to get it to breathe. After delivery of the child we had to contend with a post-partum hemorrhage and an adherent placenta which had to be removed piece-meal. The patient eventually made a satisfactory recovery.

Mrs. W., aged 27. Previous history: She had had two abdominal operations, and as a result there was a ventral hernia at the site of the scar.

I was called to see the patient at 8 A. M. She told me that the "bag of waters had brok-

en" about half an hour before while she was walking the floor. Examination showed cervical dilatation to the size of a silver half dollar. Diagnosis of vertex presentation was made.

One hour later examination revealed prolapse of the cord and hand. Consultant was called. Under chloroform anesthesia a diagnosis of right occipito-posterior position with prolapse of cord and hand was made. The hand was replaced and forceps applied. The head was delivered without rotation. The baby was dead. The mother made an uneventful recovery.

DISCUSSION:

R. A. Bate: I do not see how anyone could have accomplished anything more than Dr. Fitch did in the cases he has reported. The fact that the cord was pulsating at first showed that the child was living. Where it is impossible to force the head upward sufficiently to relieve the situation, there is nothing left to do but hasten delivery of the child. Had there been sufficient time of course Caesarean section could have been performed if forceps were inadequate. Under the circumstances it seems to me the only way of meeting the situation was speedy delivery of the child which was done in both instances. I cannot see that anyone could have secured any better results than obtained by Dr. Fitch.

Edward Speidel: The "man on the job" must decide what is the best plan to pursue in cases such as those reported by Dr. Fitch. In the first case, however, I would have resorted to rapid forceps delivery instead of giving pituitrin, not that I would have secured any better results perhaps, but I believe pituitrin increased the existing difficulties. In a recent case of prolapsed cord with head presentation I succeeded in saving the life of the child by rapid forceps delivery.

In the second case with the cord prolapsed and the hand presenting version might have given the child a better chance. As everyone understands the fetal mortality in these cases is about eighty per cent, and the man who succeeds in delivering a living child is lucky.

A point to be remembered in these cases, under more favorable conditions, is that a great deal can be gained by placing the patient in the Trendelenberg position which can easily be done by using an ordinary kitchen chair on the bed; under anesthesia in this position everything will relax, the weight of the baby will cause it to gravitate away from the cervix, and the cord may then be returned.

With a head presentation without rupture of the membranes it is important to prevent rupture until the head appears at the vulva.

The membranes may then be ruptured and the life of the child may be saved by rapid delivery.

W. P. Schwartz: In one case of the charac-

*Read before the Jefferson County Medical Society.

ter mentioned by Dr. Fitch the Trendelenberg position was tried but I did not succeed in preserving the life of the child. The cord was prolapsed and the membranes had ruptured. Pituitrin was administered to hasten delivery but the baby died.

C. G. Forsee: I assisted Dr. Fitch in delivering his second patient. The cord had ceased to pulsate at that time. The presentation was right occipito-posterior and probably at the time rupture of the membranes occurred the cord descended and in short time pressure was sufficient to cause death of the child. Under these circumstances it seemed to me the best plan was rapid forceps delivery which was done without the head rotating, i. e., the head was brought directly through the perineum in the posterior position.

J. W. Fitch, (closing): One reason for using pituitrin in the first case was that we had a very slow fire, and pituitrin was administered while we were waiting for our forceps to be sterilized. We would probably have used the forceps if the pituitrin had not acted before they were ready.

In the second case I made a careful examination when first called to deliver the woman; the membranes had ruptured while she was on her feet; the cord was not prolapsed at that time. Later examination showed the cord prolapsed. There was some pulsation then but this had ceased when Dr. Forsee arrived.

CANCER OF THE CERVIX*

By G. W. PAYNE, Bardwell.

Cancer of the cervix is a very frequent affection and nearly one-third of all cases of primary carcinomata occur in the uterus. The disease attacks almost exclusively women who have borne children. Laceration of the cervix is probably the most important predisposing influence. Cervical cancer is most frequently observed between the ages of 30 and 60 years; the greatest number of cases occurring immediately before, or during, or after the menopause.

There are two varieties of cancer of the cervix: squamous-cell carcinoma, and adenocarcinoma. The first is the most frequent variety and the disease starts primarily from the squamous epithelium covering the mucous membrane of the vaginal portion of the cervix. In the beginning the cervix is somewhat hypertrophied, hard and nodular in character. The mucosa is paler than normal, but its surface shows no signs of erosion. Later on you will find groups of papilla springing from the surface of the cervix which bleed freely upon the slightest touch. These papil-

lary or cauliflower growths may remain for sometime as small, wart-like vegetations or they may grow rapidly and eventually occupy the entire vaginal vault, completely hiding the cervix, after which it begins to break down or slough, and finally disappears leaving a deep irregular ulcer on the cervix.

The adenocarcinoma starts primarily in the cervical canal. It develops either from the cylindric epithelium covering the mucosa of the canal or from the glands of the cervix. The disease starts insidiously when the cervical membrane is not exposed by a deep bilateral laceration of the cervix, and there may be an extensive involvement before any pathologic changes appear at the external os. This is especially the case when carcinoma begins in the upper part of the canal.

Adenocarcinoma of the cervix develops slowly and the nodular masses of infiltration do not usually break down and ulcerate until late in the course of the disease.

SYMPTOMS

Hemorrhage is usually the first symptom; noticed, this may follow slight exertion, coitus, straining at stool, or walking. The amount is usually small in the beginning, and stains or streaks the vaginal discharges. Again it shows itself as a menorrhagia or there may be a loss of blood between periods. Menstruation may become more frequent or more profuse at the time of the menopause, or a periodic flow may occur months or years after the change of life. When we are asked to prescribe for a patient that has an irregular bloody discharge, either small or large in amount, between the ages of 30 and 60 years, I believe it is our duty to insist or even demand a vaginal examination. The laity does not recognize the importance of it. The bleeding in the beginning is not due to ulceration, but is caused by the chronic uterine congestion and endometritis which are produced by the neoplasm, and to the rupture of the vessels contained in the small papillae which grow from the surface of the cervix.

As the disease advances the hemorrhage becomes more constant and profuse, until eventually there is a continuous loss of blood along with the leukorrheal discharge.

Leukorrhea is an early symptom of the disease. It usually begins at the same time the bleeding appears, but may precede or follow. The discharge is usually serous or watery in character in the beginning, without odor, frequently streaked with blood and often profuse.

After ulceration begins it becomes mucopurulent and mixed with blood and fragments of necrotic tissue which impart an odor

*Read before the Carlisle County Medical Society.

of decomposition that is very fetid. As the disease progresses the discharge becomes more profuse and irritating and finally excoarations of the inner surface of the thighs and severe pruritis of the vulva develops.

Pain, as a rule, is not present in the beginning of the disease, and so long as the cancerous growth is limited to the intravaginal cervix but little or no inconvenience is experienced. But when the growth invades the uterus and the pelvic connective tissue, the nerves are either pressed upon or their structure affected by the disease, and pain becomes a marked symptom that gradually wears the patient out from loss of sleep and acute suffering. Pain therefore is usually a late symptom and does not show up until the case is well advanced. Pains are generally felt in the lumbosacral region, the pelvic cavity, the lower abdomen, perineum, rectum, bladder, ureters, kidneys and the peritonum. It may be constant or occur at intervals, and is described as lancinating, gnawing, burning or shooting in character.

Summing up the general symptoms you will find the general health of the patient remains good during the early stages of the disease, later on nutrition is disturbed and the patient becomes cachectic and rapidly loses flesh and strength. Disturbances of the gastro-intestinal tract are characterized by loss of appetite, constipation and vomiting. Toward the end of the disease painful and difficult defecation occurs.

The nausea and vomiting are partly due to the uremic state and to the foul odor of the discharges, and with the loss of appetite and constant thirst tend to keep the stomach irritated.

In conclusion let me say that we should insist on an early examination of our patients that apply for treatment through others for excessive, and irregular hemorrhages from the uterus.

The treatment is surgical and the success of this depends on an early diagnosis.

Radium has its advocates and in certain cases it has produced cures, according to Howard Kelly and others.

Benzyl Benzoate in Protozoal Dysentery.—

Haughwout considers benzyl benzoate an admirable remedy in the treatment of acute protozoal dysentery and is possibly not excelled by any of the other drugs customarily employed. However, much remains to be discovered regarding its action on the infection, and patients will have to be watched for a long period after treatment to discover if a cure has been effected. It is still too early to form an opinion one way or the other.

CASE OF HIP FRACTURED IN PATIENT AGED ONE HUNDRED AND SIX YEARS, PRELIMINARY REPORT.*

By ROBERT T. PIRTLE, Louisville

The following case seems of unusual interest because of the extreme age, the patient being the oldest person I have ever seen.

The patient is Mrs. J., born in Kentucky August 13th, 1814, consequently she is now over 106 years of age. Her grand-father lived to be 107 years old, and her father to 102. She has two living daughters, one 75, and the other older, neither of them in good health.

Mrs. J. has never had any serious illness; says she had measles over fifty years ago. Her descendants consist of 25 grand-children, 29 great-grand-children, and 8 great-great-grand-children. Her first husband had been dead 65 years, the second 38 years. Until two years ago her mind was clear; she now wanders a little in her conversation but takes an interest in her surroundings in the ward.

On May 17, 1920, the patient fell while ascending some steps at her home and sustained an intercapsular fracture of her right hip as shown by the x-ray. There is one and a half inches shortening and considerable eversion of the foot. She was admitted to the Louisville Public Hospital May 18, 1920, at 3:30 P. M., at which time her pulse was 84 and missing every sixth beat; temperature 96.6 degrees F.

On May 19, under nitrous oxide and oxygen anesthesia the leg was placed in abduction (Whitman's position) and plaster of paris spica applied from the toes to just below the ribs. This was "trimmed out" over the abdomen so the patient could be "propped up" in bed. Only one dose of morphine sulphate (one-sixth grain) has been given since admission, and that was the night before the fracture was reduced. No medicine except a mild laxative has been administered. She has not suffered since the plaster was applied; her pulse is now regular and her temperature normal. She has a mitral regurgitation and an abdominal tumor the nature of which is unknown to me as no examination has been made.

The dressing was applied nineteen days ago; the patient is comfortable and seems to be improving. The leg can be raised to permit use of the bed-pan, the patient being turned on left side and the spica suspended from pipe frame over the bed. At other times

*Clinical report before the Jefferson County Medical Society.

the leg is swing from a roller hanger on the frame and she can move herself.

The main object of this preliminary report is to show that: (1) old age is no contraindication to the use of a plaster dressing for fracture of the hip if the spica is well-applied and the patient is carefully nursed and (2) that one need not be afraid to give nitrous oxide gas and oxygen anesthesia in the aged.

I hope at some future date to make a more complete report of the case and have every reason to believe it will be favorable as to the ultimate outcome.

DISCUSSION:

John B. Richardson, Jr.: I follow the Whitman method of treating hip fractures because it seems preferable to methods formerly advocated. I had the pleasure of being associated with Dr. Whitman while some of his original work was being done and saw seven of the first patients treated by his method. The position of the fragments is usually such that if the leg is not placed in abduction coxa vara and great interference with locomotion may be expected.

With reference to the use of plaster dressings: Dr. Pirtle and myself are now associated in the treatment of a hip fracture in a much younger woman than the one he has mentioned where it is a question whether we should continue the treatment. Objection has been raised to the patient being kept in plaster under the belief that this method of fixation is apt to cause muscular atrophy. The question of impaction of the femoral neck has also been used as an argument against the use of plaster. Of course impaction has to be reduced or the leg cannot be placed in abduction. I do not believe impaction occurs as frequently as we have been led to believe nor is it a legitimate contraindication to the use of plaster.

The method of applying plaster is important. The hip must be raised and enough of the buttock included to hold the plaster firmly in place. In the ordinary methods of applying plaster too much cotton is used and in this way pressure sores are produced rather than prevented. The minimum amount of cotton should be used and care must be observed that the first few layers of plaster are applied smoothly so when it hardens there are no sharp edges to produce pressure.

The older methods are completely inadequate in treating fractures of the femur, and the plan developed several years ago by Whitman is the one of choice regardless of the age of the patient. I have never seen a hip fracture in an individual approximating the age of the one mentioned by Dr. Pirtle.

C. G. Forsee: Generally speaking plaster of Paris is the ideal dressing for fractures. However, I believe occasionally patients of advanced

age (I have never seen one of the age mentioned by Dr. Pirtle) will not tolerate a plaster spica dressing.

My plan in aged and debilitated individuals with hip fracture is to let them out of bed in a chair as soon as possible; a white stocking is then applied to the injured leg and saturated with magnesium sulphate; the following day another stocking is applied over the first and saturated with the same solution; the idea being to prevent swelling of the foot and leg. It is remarkable what good functional results may be obtained in aged and debilitated patients with hip fracture by this method of treatment.

There is one serious disadvantage in applying a plaster spica on an old person. If continued long enough to get fixation of the bone a stiff knee results which causes much pain and discomfort afterward. For that reason in elderly debilitated subjects the plan I have outlined will make locomotion possible and make their declining days more comfortable than by attempting to get a complete union of the bone.

F. L. Koontz: There is no question about fixation in abduction being proper in the treatment of hip fracture, and this is usually done successfully with plaster. When anything except plaster is used for maintaining position, there is a tendency of the injured leg to assume a line parallel with the good leg; that is, there is an unconscious effort on part of the patient to overcome the abduction. By also placing the sound leg in abduction also, either by means of a strap attached to the bed or by a spreader which will maintain the proper angle this tendency can thus be overcome and the broken limb maintained in abduction without trouble. However, I believe a plaster dressing should be used in preference to any other means of fixation.

L. L. Solomon: It is indeed remarkable, that Dr. Pirtle's patient did not die during the first few days following the accident, and before coming under the physician's care. She was surely entitled to die from a hypostatic pneumonia; that she did not die therefrom or from shock following the injury, is no less remarkable. A patient at so extreme an age—one hundred and six years—is likely to die of pneumonia or of shock, and if not from either, then from exhaustion or from uremia. That this lady after such a serious injury as fracture of the hip survived all of these terrors of old age and has not since died, but continues to live, marks her as a wonder among wonders. That she survived an anaesthetic entitles her to additional fame. I congratulate Dr. Pirtle upon his unique patient and congratulate herself upon an unusual survival against odds ordinarily overwhelming. And though I am rarely other than serious, may I be pardoned for this jocosity? You are all familiar with the superstition that a woman who falls going up,

stairs is not supposed to marry within the year. As Dr. Pirtle's patient has thus far disproved all current theories and ordinary rules, I predict that notwithstanding her age she will upset the marriage superstition and "double up" within the year.

Edward Speidel: I would like to ask whether Dr. Pirtle expects to get union of the fractured bone in a patient of that age?

R. T. Pirtle (closing): I do not see why union of the fractured bone should not occur, regardless of the advanced age of the patient. The woman is still living and her metabolism appears normal.

In applying the plaster dressing I merely tried to get fixation of the hip so that movement would not produce further shock. The importance of this was demonstrated by the fact that when the patient was moved to the x-ray room and also to the operating room for application of the plaster she became very much exhausted. After application of the plaster she became comfortable and her pulse and temperature receded to normal.

To secure an extreme degree of abduction plaster must be extended high on both sides in the form of a "U" and downward so that only the toes are exposed. A shorter spica was used in this case.

Dr. Forsee says he always gets his patients out of bed and in a chair as early as possible. The objection to that method is the resulting deformity and shortening. I recall one case where under that method of treatment there was shortening of more than two inches, and in another there was non-union. Pain in the knee and ankle can usually be overcome by the application of heat and massage.

Flours in Infant Feeding.—Aron calls attention to the way the infants thrived during the war on flour containing a large proportion of bran. It was first made into bread dough and baked in thin sheets, and then pulverized. The low carbohydrate content of the flour thus prepared and hence its low fermentability, on the one hand, and, on the other, its high content in extractives which stimulate metabolism and peristalsis, have solved, he declares, the problem of flour in infant feeding.

Polypoid Carcinoma of the Stomach.—A case is reported by T. Grier Miller, Philadelphia (Jour. A. M. A., Jan. 22, 1921) in which a diagnosis was made of primary pernicious anemia eighteen months before death. The case is also noteworthy on account of the evidence which it presents in favor of ulceration with hemorrhage in benign gastric tumors and for the secondary development of malignancy in such neoplasms. The probability is stated that the malignant change was secondary to a benign adenoma.

RECOGNITION AND TREATMENT OF THE PREMONITORY SIGNS AND SYMPTOMS OF PROSTATIC HYPERTROPHY*

By OWSLEY GRANT, Louisville

The mortality of the operation of prostatectomy, as well as its final success depends upon three factors, firstly the early recognition of the obstructing prostate as the cause of symptoms, secondly, the preoperative treatment and preparation, and thirdly, the surgical technique.

To conceive of the real seat of the patient's illness being in an obstructing prostate, with no consideration for the other factors involved is to consider the cause without the effect. As far as its own maliciousness is concerned the benign prostate per se is as harmless as the sebaceous cyst or the lipoma. It is because of the effects that its obstruction entail to the proper elimination of the toxic products of the body through the urinary channel that it is the foe of old age. We may for a moment leave malignant prostate out of consideration, in so far as it is dangerous as the seat of recurring tumor and consider only the dangers it induces in connection with its more frequent brother, benign hypertrophy.

Normally the process of life maintaining functions of the body consist of ingestion, digestion, absorption, nutrition and excretion. To derange any one of the functions is to endanger life or health at least and create a vicious cycle that in turn disturbs them all. We may consider that of excretion as the one we have to deal with here, and it is in the interruption of the validity of that function that the obstructing prostate offends. Upon the kidneys depends so vital a function of life and so closely are they coordinated with the blood vessels, the heart and the liver that damage to their function of structure is a threat to life itself. The passage of the urine, which of course only becomes urine after it passes through the glomeruli and tubules of the kidney, from the renal pelvis to the meatus of the penis is a tortuous but continuous stream bed. Obstruction in any part of it creates a dam, whose back flow destroys the tissues about it, because it cannot overflow its banks as a stream and of these tissues the first to suffer seriously is the bladder and secondly and much more important, the kidneys. It is for this reason that it is all-important to offer aid, nay to insist on it, before these structures are irreparably damaged and it is the failure to realize that

*Read before the Jefferson County Medical Society.

prostate hypertrophy creates by its damming the urinary outflow a disturbance so far removed anatomically from its site that patients are palliated with a catheter or urotropin or massage until the foe reaches the citadel, despite the warnings of the outposts.

The obstructing prostate so seldom occurs in men under 50 years that its occurrence is the occasion for remark. 65 per cent of men over this age have more or less prostatic obstruction, though by no means serious. So far no definite antecedent factor can be determined, it falls alike on the just and the unjust on the chaste and the licentious. Whether it can be prevented or not is open to question, but once it has occurred its call for relief cannot be disregarded. It is this early stage to which I wish to call your attention and enlist your skill and acumen in its management.

Without exception the first symptom of obstructing prostate is difficulty in urination. The prostate is so moulded about the internal orifice of the bladder that its enlargement in any direction encroaches on the lumen and position of the urethra and in order for the patient to empty his bladder he must use the accessory muscles of urination. Its insidious growth gradually distends the phable bladder muscles by their efforts to overcome the obstruction and the next stage is a dilated, thinned bladder. From here the dilation extends up the ureters and the renal pelvis to the structure of the kidney itself which then becomes unable to perform its function of excretion properly. In this reservoir of stagnant urine breed pathogenic bacteria as in a culture tube and add infection to dilation, a most potent ally.

Not all obstructing prostates are large, some are very small and fibrous and on rectal examination give no clue to the cause of obstruction. Again the encroachment of the large prostate may be wholly within the bladder and scarce any enlargement felt per rectum at all though the prostate be very large. But be they vesical or extravescical, adenomatous or fibrous, those causing obstruction all give the same symptoms.

After the stage of difficult urination has existed the next symptom will be either dribbling from the over-distended bladder or complete retention. This stage is the beginning of the prostatic's last days and unless immediate surgical measures intervene he is a doomed man. Any prostatic who demands a catheter for a period of two weeks is beyond all palliative measures and his days are numbered only by the severity of the infection which follows its use in spite of every precaution, and the last day of the unoperated prostatic is his best day.

The differential diagnosis of prostatic obstruction is not always easy and frequently demands the cystoscope for its positive confirmation. The distended bladder may be the result of tabes with its atony of the bladder walls, the nocturnal frequency may arise from cystitis or stone, the diminished size of the stream from stricture, the rarer and later sign of bleeding from tumor or injury. We set about to determine and separate these different causes in a definite way. The patient comes to us complaining of difficulty in making his water, getting up several times at night, and perhaps a feeling that the bladder is not emptied when the act of urination is completed. First, a careful physical examination is made of the patient's general condition, his reflexes tested, his abdomen examined for tumors or distended bladder, his heart and lungs gone over. Then the patient is requested to empty his bladder into a glass container as completely as he can, and we note the size and force of his stream, whether there is any dribbling afterwards or any indication of pain. If the urine is clear it is evident that no serious infection has occurred as yet, cloudy urine due to pus, and alkaline urine indicate danger. Immediately after the act of urination a catheter is introduced into the bladder and if more than an ounce of residual urine is obtained we can say definitely that his bladder is not being emptied properly and there is obstruction from some cause. And here one word about passing the catheter. It is preferable to use a soft rubber catheter of the Nelaton type, about 18 French size where possible. If this passes easily up to the posterior layer of the triangular ligament where the prostrate begins, and then will go no further, but bends upon itself then we have of almost surety an obstructing prostate. A second attempt should be made then with an elbow catheter of woven silk. This elbow will enable the catheter to ride over the obstruction in most cases and pass into the bladder. Both of these failing, recourse must then be had to catheter of other types especially constructed to overcome obstructions. The use of the silver catheter is dangerous in the extreme and should be employed only by the most skilled hands. If the bladder is greatly distended by a large quantity of urine great care must be had not to empty the bladder completely at one sitting, but draw off eight to ten ounces, then plug the catheter and leave it in place and by removing the plug every two hours and drawing off not more than two ounces each time complete the removal of the urine gradually. This sudden emptying of the long-distended bladder, either by catheter or trocar,

abruptly relieves the back pressure on the kidneys with the consequent result that they become engorged and produce a shock to the circulatory system that many an aged man succumbs to. Should the catheter meet obstruction anterior to the prostatic urethra there is then most certainly a stricture which may be the whole or partial cause of the obstruction and should be treated in the manner prescribed for that ailment.

The next step in the examination is the palpation of the prostate per rectum. Diagnosis by this means is not always certain because the type of prostate varies so. To the examining finger the extravescical adenomatous prostate is a firm but compressible mass, varying in size from a lemon to an orange or larger. The fibrous prostate is much smaller, frequently not appreciably enlarged and often diminished in size. Its consistency is firmer than the adenoma, however, and it is not compressible. The malignant prostate proper can nearly always be felt with ease because malignancy almost invariably begins in the posterior lobe, that portion of the prostate first presenting to the examining finger. The characteristic of this prostate is its stony hardness and irregularity.

The history, the examination of the urinary function and urethra, and rectal palpation then are the measures first used in making the diagnosis of obstructing prostate in the hands of the practitioner and further confirmation in doubtful cases can only be made with the cystoscope. The feature of the cystoscope is that it will reveal the type of prostate, the location and extent of its enlargement, whether stones or tumor complicate it and in the vast majority of cases whether it is definitely malignant in origin or not. It is estimated that about one in five of hypertrophied prostates show some malignant change. This malignancy, however, is most frequently only a beginning change in the interior of the gland and its complete enucleation renders the danger of recurrence practically nil.

There is one stage we find so often in old men that should be spoken of, that is what is known as the pre-prostatic stage. These men have a mild degree of hypertrophy which under ordinary circumstances cause little or no disturbance, but exposure to inclement weather, sudden chilling or perhaps some mild intercurrent malady causes an abrupt swelling of the prostate and makes urination temporarily difficult or impossible. This swelling however, subsides under rest, warmth, hot rectal irrigations and purgation in a few days and the patient resumes his former status. But this class of cases must be watched with great care for they will develop a real irreducible obstructing prostate unless most rig-

id precaution is employed and their advent into this stage is marked by residual urine, straining and nocturnal frequency.

Nothing has been said here relative to the preoperative treatment and the estimation of the kidney function by the pthalein test and blood urea retention determination. These measures are properly part of the armamentarium of the urological surgeon and are his criteria to determine when and how to operate. Such surgical questions as these and the advisability of the type of operation do not belong to the scope of this paper, even though they are the determining factors of so many lives.

One of the first questions the prostatic asks you when you suggest operation is, "Doctor, is this a serious operation?" The seriousness of the operation depends almost entirely upon the length of time that patient has suffered from the obstruction and the damage done to his kidneys. In the hands of skillful men, devoting themselves almost exclusively to this type of work, who are thoroughly equipped to carry out the preliminary tests, and estimate accurately the proper selection of time and technic, the mortality is about five per cent. or not more than would be expected from any major surgical operation on men of advanced age. But the all-determining factor in this mortality rate is the proper estimation of the patient's kidney function and the considerations of the contra indications for operation. Many of these patients, especially advanced prostatics, will require from two weeks to two or three months preliminary treatment for the proper restoration of their functions before the actual removal of the gland, but they are the most valuable weeks in their lives, and it is during this time that kidneys which may be almost non-functioning may be restored to serviceable and almost normal organs. The mortality from catheter life, as well as its horrible inconvenience and embarrassment we all know too well. There are one or two men in the experience of each of us who has led a catheter life for a period of years but his prolonged existence only proves he is a rare and uncomfortable exception to the rule that patients on catheter life survive that ordeal for a limited period of months of discomfort, only to die of renal sepsis and ureamia. The after results of prostatic enucleation in skilled hands are excellent almost invariably. With the recent improvements in technic and after care an incontinence or a fistula is a rarity and the patient goes about his daily routine entirely forgetting that he ever had a prostate.

In conclusion then we urge the thorough

examination and consideration of every man above fifty, especially, who presents symptoms of difficult miction, or nocturnal frequency along the lines outlined, the history the examination of the bladder by catheter and rectal examination. With our recognition of the dire results and increased mortality that follow delay as surely as night follows day are we ever justified in prolonged palliative treatment of these sufferers who grow daily worse before our eyes? Every obstruction to urinary outflow is a clear clarion call of danger and he who heeds it first is the most fortunate, whether he have a stone or tumor or obstructing prostate of perhaps all three at once.

BRIEF RESUME OF THE NASAL ACCESSORY SINUSES AND THEIR IMPORTANCE*

By A. L. BASS, Louisville.

My purpose in bringing this subject before you is: (1) to emphasize the importance of the nasal accessory sinuses, and further the interest of the epoch-making advances in recent years in the field of focal infections; (2) to present some clinical phenomena associated particularly with foci found in the accessory sinuses which, in my opinion, have not been given due consideration; (3) to present some of the evidence, which is conclusive, that focal infections found harbored within the sinuses, are one of the greatest menaces to health.

It may be well to relate that the nasal sinuses are lined with a thick and spongy mucous membrane, provided with a large number of glands; namely, mucous and serous.

The mucous glands secrete a fluid rich in mucin, while the serous glands secrete an albuminous fluid. The surface of the mucosa is covered with columnar epithelium between which are the goblet-shaped mucous cells. The blood vessels, which supply the mucous membrane and cells their nourishment, are branches from the sphenopalatine arteries, subdivisions of the internal maxillary and facial; and as customary veins which correspond to the arteries in general, convey the venous blood to the general circulation. In order that the glands may be enabled to discharge the amount of secretion necessary, it is essential that the vascular supply be varied at times in accordance with the nutritional needs and functional activities of the mucous membrane and the contained glands. The secretion of the glands and blood supply

furnish the nasal chambers with the moisture and temperature necessary for the preparation of the air for the lungs.

In discussing the diseased sinuses, I will begin with infants and young children. The most common symptom is sneezing, although there are many other affections which will cause sneezing; other symptoms are nasal obstruction, frequent colds, nasal discharges, and headache. If dullness, underweight, malnutrition, and poor color,—characteristics of diseased tonsils and adenoids,—do not disappear after their removal, the sinuses should be investigated, especially so if one is unable to find anything abnormal in the upper respiratory tract.

The roentgen-ray is a very valuable diagnostic aid in children because it not only helps to inform one if there is any trouble, but whether or not the sinus exists, its size, and the level of the Highmore floor; if one intends to puncture it.

Dean, in his paper, on "Nasal Sinus Disease in Infants and Young Children," found that in all children suffering from arthritis within the last eighteen months in his clinic, the disease was due either to the sinuses, faucial or pharyngeal tonsil; in no case were the teeth or the lingual tonsil a source of infection. Prior to July, 1918, two hundred and thirty-four children, thirteen years of age or younger, suffering from adenoids and diseased tonsils had been examined; in 15 per cent of these cases infection of one or more sinuses was found; the sinuses were not treated but the tonsils and adenoids were removed and the patients were asked to return within four to six weeks; only seven returned and five of these were free from sinus involvement. Since July 1, 1918, he had investigated the sinuses of one hundred and forty-five patients with adenoids or adenoids and chronic tonsillitis, and found that sixty-five had sinus disease. In his report of the bacterial flora found in the sinuses, he examined fifty-five cases in which prior to antrum puncture there was no reason to suspect sinusitis; he found that two had pus in the antra, eight had clear mucus, and forty-four had neither pus nor mucus. He reports a series of forty-three cases in which no definite evidence of sinusitis was present, but the roentgenographic plates indicated trouble. In this series twenty-six were sterile, ten showed mucus and seven showed pus.

There were bacteria found present in thirty-five out of the ninety-eight in these two groups. In the thirty-five cases, fifty-one antra were found infected. The staphylococcus was present in forty-five, pneumococcus in thirteen, unidentified gram negative bacillus in eight,

*Read before the Jefferson County Medical Society.

diphtheroid bacillus in seven, hemolytic streptococcus in five, streptococcus viridans in one, and the Friedlander bacillus in two.

He reports a series of twelve cases of arthritis which did not subside after the tonsils and adenoids were removed; nine of the twelve had definite pus in the antra, two had thick glairy mucus, and in the other pus was present in the ethmoid cells. The only organism found in this group was the streptococcus pyogenes.

One striking thing to me in this report is the absence of the Pfeiffer bacillus which causes the malady many of our sinus infections follow. From this report I believe that the Pfeiffer bacillus acts in reference to the sinuses like it does to other parts of the body, i.e., by devitalizing the tissues and lowering vitality, producing a fertile field for some other bacteria, more or less toxic, to produce their manifestations.

Skillern states that in health the sinuses are sterile and quotes the work of Korner, who in twenty autopsies on bodies not dead more than two hours the antra were sterile in every case.

Fetterolf reports a case of vagatonia in a boy of twelve who had trouble for five years following measles when he was left with a marked nasal discharge. At the time he presented himself to Fetterolf he had lost nine pounds in four weeks, was vomiting all his meals, which condition soon changed to weekly attacks of severe abdominal pain, nausea and vomiting, lasting one or two days. With the aid of the roentgen-ray he made a diagnosis of chronic suppuration of ethmoids and sphenoid left side, which was verified at operation, followed by immediate improvement and disappearance of symptoms.

In acute sinusitis of the antrum in the adult the patient generally complains of pain in the antrum radiating toward the ear on the affected side. This I have noticed in nearly every instance of acute sinusitis in the adult, while Pontoppidan reports a series of one hundred and seventy-five cases in which only nine per cent had pain in the antrum or jaw. The pain is usually continuous and severe. In many instances the patients say they have "neuralgia" on the side affected. Cryer says the pain is due to the fact that the branches of the inferior dental nerve which cross the floor of the antrum are protected only by the mucous membrane lining the cavity, which leaves them almost exposed to irritation and pressure. Upon examination there is pain on pressure over the antrum involved, and the nasal mucosa on the side affected is turgeseent, and usually there is a creamy discharge in the middle meatus, which will flow more free-

ly following the application of adrenalin between the middle turbinate and the lateral wall.

From the fact that the frontal sinus, anterior and middle ethmoid cells, and antrum, drain in to the middle meatus it is trying at times to diagnose the existing condition. If the frontal sinus is affected primarily it is likely to involve the ethmoids and the antrum on the same side if allowed to continue for a short while, especially so if the frontal sinusitis becomes chronic.

Chronic sinus inflammation follows the prolongation of acute or recurrent attacks. In many instances, when the inflammation becomes chronic, the subjective and constitutional symptoms are slight, absent or distant, making it more difficult to trace the focus of infection when it manifests itself in some distant part of the body. In fact, it is not infrequent that we "stumble upon" a chronic sinusitis, when examining the patient for some other complaint not relative to the sinus involved apparently.

Transillumination is a very important aid in diagnosis. Pontoppidan in his report stated that it was positive in one hundred and forty-two out of one hundred and fifty-two cases in which it was used. The ages by decades were:

From 10 to 19 years	31 cases.
From 20 to 29 years	55 cases.
From 30 to 39 years	49 cases.
From 40 to 49 years	17 cases.
From 50 to 59 years	14 cases.
From 60 to 69 years	4 cases.
From 70 to 79 years	3 cases.

The cases were about equal as to sex; the left side was more frequently involved than the right. In forty-four cases the infection was double. As to etiology, four cases only were of dental origin; usually there was a history of cold or influenza; three cases due to trauma; three were malignant; two syphilitic; and one fibrous polyp. Duration was from two to ten years; forty per cent had headache, frontal or above the eyes, or at the root of the nose. Three patients had typical infraorbital neuralgia. Fifty-three per cent had nasal symptoms; usually obstruction, either unilateral, bilateral, or alternating. Some had coryza, sneezing or bad odor. Ten per cent had ear symptoms, from acute otalgia to tinnitus. Twenty per cent had general symptoms, malaise, fatigue, etc.

Radiography, he believes, is rather superfluous. On the contrary I think it is very important at times, e.g., I recall a patient who had had an ethmoidectomy, the frontal sinus ostium enlarged, and an antrum opera-

tion all on the same side, and the work was well done according to my judgment. All her upper teeth had been extracted apparently and gums healed for some time. The x-ray revealed a blind tooth protruding into the floor of the antrum anteriorly; this was extracted, she was treated a few times, and her symptoms disappeared. The roentgen-ray is valuable in helping to decide what procedure to adopt in treating the affected sinus; for if it shows a shadow which is rather dark instead of a light shadow, it is indicative of something present besides an infection; a cavity full of granulation tissue, polyp, or what not; then, too, the extent of the shadow is valuable in that it helps to decide the amount of the trouble present, and if any approximate sinuses are involved.

Time will not permit a full discussion of all the diseases of the sinuses and their different manifestations; but if I am able to cause you to realize their importance and consideration a little more I will feel justified in my undertaking.

Via conclusion: I wish to emphasize the fact that the most important thing in treatment of sinus disease in infants is the removal of tonsils and adenoids. Also, the importance of early recognition of a diseased sinus so as to properly treat it, so as to offer the patient quicker relief in order that the infection may not be so likely to recur and less liable to become chronic; so as not to harbor foci of which the patient may be ignorant and which are likely to produce manifestations elsewhere in the body resulting in disease of a more or less serious nature.

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DISCUSSION:

G. C. Hall: The work of Dr. Dean, of Iowa City Iowa, in the diagnosis of sinus disease in infants marks one of the most notable advances during recent years in this department of medical practice. When we recall the difficulties sometimes encountered in making a positive diagnosis of sinus suppuration in children his work assumes tremendous importance. He has shown positively that arthritis may be cured in certain cases by the removal of diseased tonsils and adenoids. His work has been done in a general clinic where other causative factors and abnormalities are eliminated, and he has shown that arthritis which had persisted despite other methods of treatment was due to sinus infection and cure resulted from operative treatment of the infected sinuses.

Relative to sinus infection producing symptoms in other parts of the body: I have often seen uveal infection associated with sinus disease.

Owing to the proximity of the sphenoid and posterior ethmoid cells to the optic nerve, eye symptoms frequently result from sinus infection. Neuritis and enlargement of the blind spot have been noted.

As to the diagnosis of sinus infection: As a rule the affection is unilateral, there is persistent nasal obstruction with discomfort on the affected side, and in cold or damp weather pain over the sinus and a persistent unilateral nasal discharge. In children the disease must be differentiated from nasal foreign bodies, nasal diphtheria, etc. It has been my observation that offensive odor is noted only where the antrum and ethmoid are involved.

S. G. Dabney: Dr. Dean, of Iowa City, Iowa, first called attention to nasal sinus infection in children two years ago; his latest paper was published last summer. Nasal sinus infection does occur in children, but not very frequently according to my judgment. We have been taught that on account of the immature development of the accessory sinuses young children were immune to sinus infection; we now know that is a mistake.

In the discussion on Dr. Dean's latest paper, in which a number of gentlemen took part, including St. Clair Thompson, of London, the consensus of opinion was that sinus infection in children was nearly always cured by removal of diseased tonsils and adenoids.

It is not quite clear to me how diseased tonsils and adenoids can produce sinus disease in children, whether by obstruction or as foci of infection.

By far the most interesting contribution to sinus infection recently published is by Dr. White of Boston, Mass. He reported from his personal experience seventeen cases where disease of the accessory sinuses, notably the posterior ethmoid and sphenoid, affected the optic nerve and produced optic neuritis. His paper appeared in the last number of the *Annals of Otolaryngology*. All his patients were operated upon and nearly all recovered partially or completely.

Dr. Bass emphasized the importance of focal infection in connection with sinus disease: Two years ago a gentleman came to me suffering from frontal sinus infection. From time to time he would have severe attacks of arthritis with temperature of 103 to 104 degrees F., but the joints never suppurated. Each attack would confine him to bed for a week or more. I believed this man was cured of his arthritis by treatment of the sinus disease. When he first came under my observation the arthritis recurred about once per month. His frontal sinusitis was cured by intra-nasal treatment and he has been well for

more than two years—no more arthritis either.

A Louisville physician had an accumulation of pus in the antrum of Highmore and ethmoid cells. His blood pressure was very high and he had become exceedingly nervous and anemic. His blood pressure has been greatly reduced and his general condition vastly improved since his sinuses were drained.

Dr. Bass did not mention asthma in connection with sinus infection: It is well known that asthma may be greatly aggravated by sinus disease. I have seen many cases of this kind and believe the asthma has been cured in a few and helped in many by curing the sinus infection. I recall one patient particularly who has been free from asthmatic attacks for several years. Whether the asthma in such cases is to be regarded as the result of focal infection or represents a reflex phenomenon we do not know.

F. T. Fort: While in Chicago several years ago I saw a patient who had epilepsy associated with accessory sinus disease. A specialist there claimed to be able to cure the epilepsy in such cases by operating upon the ethmoid cells. This patient was subjected to operations and I understand the result was satisfactory. I later had the opportunity of seeing the specialist perform one of his operations which was done through the nose. He told me he had cured several patients of epilepsy and other obscure affections by that method of treatment, and showed me a "tolu bottle" half filled with fragments of bone which he had removed, so he must have operated upon a great many patients.

I wish Dr. Bass in closing would state whether he has observed cases of epilepsy associated with accessory sinus disease and whether the epilepsy was relieved by operating upon the sinuses.

A. L. Bass, (closing): I do not recall having encountered an instance in which epilepsy was associated with accessory sinus infection. Asthma not infrequently accompanies chronic sinusitis, and in several cases I have had where these two affections were associated the asthma was benefited by sinus operation.

The removal of diseased tonsils and adenoids is indicated in every case where sinus disease is present in children. Congestion is thus relieved and sinus drainage facilitated.

Tuberculous Typhobacillosis.—Caussade and Doumer describe a case of the Landouzy type of tuberculosis, that is, with a pronounced contrast between the severe general symptoms of the infection and the insignificant local lesion. The tuberculosis septicemia had followed close on a nodular and vesicular eruption. The lesion in this case was merely a focus of congestion in the lung which retrograded completely, like a pneumococcus process, and the whole storm seemed to blow over in about nine weeks.

KIDNEY CYST AND ECTOPIC GESTATION; CASE REPORTS*

By J. B. LUKINS, Louisville.

Cysts of the kidney are comparatively rare. They may be simple, serous, hydatid, polycystic, or dermoid in type. They are said to occur more often on the left side than the right, and may be bilateral.

The following case first came to my notice in the spring of 1918: Mrs. H., aged sixty-three, family history negative for malignancy, syphilis and tuberculosis. Patient has had no serious illness except grippe and malaria. Heart, lungs and pelvis organs normal.

A few months previously she had noticed a lump in the upper left side of her abdomen. Examination revealed a mass which was easily palpable and freely movable, but I was unable to decide just what organ was involved. (However, as there was no pain, and the patient's general condition was good, I advised waiting.

She returned to see me early in February, 1920. Examination then showed the tumor very much larger, and the patient complained of a constant dragging sensation. The blood count was normal; urine showed a trace of albumen, skin slightly jaundiced; patient had lost twelve pounds in weight. Provisional diagnosis: cyst of the spleen.

On February 19th, the patient came to operation. With the assistance of Dr. Charles Farmer the abdomen was opened by longitudinal incision in the upper left quadrant. The lower edge of the spleen was palpated and found normal. The mass was retroperitoneal and proved to be a cyst attached to the lower pole of the left kidney. The kidney tissue itself was not involved. The cyst was about the size of an average-sized grapefruit. Microscopical diagnosis made by Dr. Stuart Graves: "Thin fibrous tissue wall with slight, chronic inflammation."

The patient made a rapid recovery and left the hospital on the fifteenth day after operation. She has regained her loss in weight and the albumin has disappeared from the urine. The age of the patient, the loss of weight, and the comparative rapidity of the growth, are the features which to me made the case seem of sufficient interest to report.

R. D., colored, aged twenty-seven, family history unknown; no previous illness. Heart and lungs negative. Her menstruation began at seventeen, was often irregular and dysmenorrhea usually present. She is the moth-

*Clinical report read before the Jefferson County Medical Society.

er of one child aged seven and in good health; no miscarriages.

Date of last menstruation December 15, 1919, duration four days. On January 4, 1920, the patient said she "got out of bed and felt as if her womb had dropped." She also "felt fainty and had smothering spells." She had a great deal of pain in the abdomen but no bleeding at that time. Pain would persist for a few days and then subside. Similar attacks recurred at intervals of several days throughout the month of January.

About the first of February the patient began to bleed slightly after the attacks of pain. There was no vomiting. She said that during cramping spells the abdomen seemed to enlarge. A hard lump was felt in the right side and there was considerable tenderness.

Vaginal examination revealed a slight yellowish-brown, blood-tinged discharge; cervix pushed to extreme right side, large mass in cul-de-sac painful on pressure. Bimanual examination showed also a large movable mass in lower right quadrant within an inch and a half of the umbilicus. Provisional diagnosis, extra-uterine pregnancy complicated with ovarian cystoma.

On March 1, at nine a.m., the abdomen was opened and a soft uterus, purplish in appearance, about the size of a three-and-a-half month's pregnancy was found. The uterus was perfectly smooth, soft and movable. On the posterior surface and in the cul-de-sac was a mass consisting of the ruptured right Fallopian tube which was incorporated in the mass, and attached to the posterior wall of the uterus was a loop of small intestine. The coil of intestine and adhesions were loosened and the tumor removed. While the abdomen was open the uterus was thoroughly inspected and palpated, and the conclusion reached that the woman was pregnant. The abdomen was closed without drainage and the patient discharged from the hospital on March 19.

Pathological examination of the specimen was made by Dr. Stuart Graves whose report follows: Gross description: Specimen consists of dull reddish-gray mass of moderately firm tissue, 60 by 45 mm., somewhat globular and covered with fibrous tags. Mass is incised longitudinally exposing a cavity of about 10 mm., in diameter, lined with a smooth, thin, apparently serous membrane which can be pulled away from the wall of mass. Opposite surface of this membrane is irregular and spongy, resembling chorionic villi. Wall of large mass is dark red in spots, in other paler reddish-gray and slightly homogeneous. Microscopical diagnosis: blood clot, chorionic villi, decidua.

DISCUSSION:

Charles Farmer: According to the literature kidney cysts of the character described by Dr. Lukins are exceedingly rare. It is stated in the book of Kelly & Burman that only thirty-eight cases had been collected prior to 1903, to which they added two. Large kidney cysts are usually not diagnosed until the abdomen is opened; they are more often than otherwise mistaken for ovarian cysts.

The etiology of these cysts is unknown. The most plausible theory is that they are the result of distension of a renal tubule which has never opened, or one that has been closed by inflammation. This is the first tumor of the kind that I have ever seen. Had we known it was a kidney cyst our incision would have been made in the loin, but we did a transperitoneal operation not knowing just what the pathology might be.

J. G. Sherrill: The origin of kidney cysts depends upon the type of the cyst. Polycystic tumors of the kidney are usually bilateral and are different in origin from the one just shown.

This cyst probably developed from remains of the Wolffian body which did not leave the original site but remained in the kidney region.

That is the most plausible explanation offered for the origin of cysts of this type. It is similar to cysts which develop in the broad ligament, i.e., the so-called par-ovarian cysts.

John K. Freeman: In the second case reported if it is proven that the woman has a uterine pregnancy coincident with ectopic gestation, the case is certainly unusual. Time will definitely solve the problem, and I would suggest that Dr. Lukins report to the society his later findings.

We have the evidence that ectopic gestation existed, and if the woman also has a uterine pregnancy, the case is unique.

Guy P. Grigsby: I saw the second patient mentioned by Dr. Lukins when the operation was performed. While the appearance of the uterus was suggestive of pregnancy, if this had been true the woman would probably have aborted inasmuch as the tube and ovary were removed. Moreover, coincident ectopic and uterine gestation must be exceedingly rare.

I believe that time will prove that the woman has a uterine myoma and is not pregnant. The fact that she did not abort following the operation is a strong argument against the existence of uterine gestation.

J. B. Lukins (closing): I was almost certain at the time of operation that uterine pregnancy existed in the second case reported. That the woman did not abort does not prove that she has not a uterine pregnancy. I have often removed gall stones, diseased appendices, etc, in pregnant women where abortion did not follow the operation.

If this patient has a uterine myoma it is the

softest one I have ever encountered. The uterus was perfectly smooth, practically symmetrical, and showed every indication of pregnancy, although on palpation the cervix was not quite like that of a pregnant woman. The uterine fundus is now within one finger breadth of the umbilicus.

The patient had an occasional pain during the first forty-eight hours after operation, and it would be impossible to say positively now whether this was due to gas or uterine contractions. I shall be glad to report to the society when "time tells the story."

MALIGNANT DISEASE OF THE SUPERIOR MAXILLARY BONE: CONTINUED REPORT*

By SAMUEL G. DABNEY, Louisville.

I desire to mention briefly, because my information is insufficient to make it complete, a case reported before this society January 10, 1919. Drs. Frank and Graves will remember the case.

The patient was a man aged sixty-three years. There was no history of syphilis and his blood Wassermann was flatly negative. He came to me for relief of what seemed to be a suppurative disease of the antrum of Highmore. Performed a minor operation through the nose which gave him considerable relief. This was for the purpose of securing drainage of the antrum.

For some time the patient had noticed a slightly painful swelling over the left cheek bone the cause of which seemed a little uncertain, but I told him there were three possibilities, viz, (a) a phlegmonous inflammation from extension of the infection of the antrum, (b) syphilis, although the Wassermann was negative, and (c) cancer. I informed him if the swelling was due to the phlegmon or syphilis there was little cause to worry.

As the case was rather out of my line I suggested that he consult someone else, but as I had operated upon him once he insisted that I continue to treat him. Superficial incisions were made in the gum and under the cheek but no pus was found. Finally I urged him to see a general surgeon and he selected Dr. Louis Frank. It is only fair to say that at this time both Dr. Frank and myself thought there was pus in the cheek, and it was believed my incision was too superficial to reach it. Roentgen-ray examination showed nothing significant. The man was then given an anesthetic and deeper incisions made both in the gum and cheek under the orbit.

The tumor was then half the size of an English walnut and not very painful. No pus was found but some soft grumous material was removed with curette which looked very much to me like malignant tissue. Dr. Stuart Graves made an immediate examination of the material and expressed the opinion that it was a "malignant growth."

The most interesting feature in connection with the case remains to be related. Of course malignant growths about the face are not so rare as to make them worthy of record unless there are features of especial interest. Dr. Frank saw the patient the following day and stated that he believed the case was inoperable. There seemed nothing to do but to keep the patient as comfortable as possible. He was intelligent and philosophical and wanted to know the truth, so we told him that he had a serious disease, and he remarked "just give me enough morphine to keep me easy and let it go at that." I promised to see that this was done and arrangements were made accordingly.

Instead of becoming rapidly worse as we had expected the man immensely improved during the next few months. However, the swelling about his face did not entirely subside and several small abscesses developed which opened spontaneously and discharged a little grumous material; but he became well enough to return to his business and that was his condition when the case was reported to this society. He had greatly improved during the intervening eight or ten months after three of us had decided he had a fatal disease. He drifted out of my hands professionally but I saw him occasionally as a friend more than anything else. I understand he was treated by the roentgen-ray at one of the local laboratories.

A few months ago I saw a notice of this man's death in one of the newspapers. Subsequently I met his widow on the street and told her I had been greatly interested in her husband's case because it had not pursued the course such things usually do, and we had hoped for a long time that we had been mistaken in our diagnosis. She said "no, doctor, he died of cancer," and explained that the disease had extended until it finally involved the orbit.

When this case was originally reported, and this is my apology for thinking it worthy of a continued report, there was quite a difference of opinion among the members present as to the diagnosis. One of the surgeons was skeptical about its being cancer as the man had improved so markedly, and particularly because of the region involved. It was thought, too, quite improbable that the micro-

*Clinical report before the Louisville Medico-Chirurgical Society.

scopic examination could be implicitly relied upon under the circumstances, as Dr. Graves was asked for an immediate opinion while the patient was on the operating table. Someone suggested that the negative Wassermann reaction did not positively exclude syphilis. Large doses of potassium iodide had been administered without effect. We who saw him agreed that the man had malignant disease of the superior maxillary bone, and this proved correct although the course of the disease was most unusual.

DISCUSSION:

Louis Frank: As a rule malignant growths about the antrum of Highmore are at first of slow development, but after they once perforate the bony wall and involve the adjacent tissues they grow rapidly, and it is then usually too late to accomplish anything by radical surgery. That at least has been my observation and experience.

About the time I saw this patient with Dr. Dabney, nearly three years ago, a woman came under observation with undoubted cancer of the antrum. It was thoroughly removed with curette, the eye was enucleated, and radium was used afterwards. That woman lived until about two months ago, fully three years after operation. Until the orbit became involved, which was probably six months ago, she did not begin to decline in general health.

In the case Dr. Dabney has reported I was inclined to think the man had an abscess in the cheek, but when Dr. Graves made his report we were forced to the conclusion that we were dealing with a malignant growth.

J. Garland Sherrill: Dr. Dabney's report recalls an interesting case which came under my observation many years ago. A girl of twenty presented for examination with a mass in the region of the antrum which according to the history had developed subsequent to a blow on the cheek. There was a protrusion of the cheek about the size of a small orange; the bony wall of the antrum was so friable that a needle readily entered the mass and pure blood was obtained. Probably the needle was not introduced to a sufficient depth to reach the structure of the tumor. In any event the young woman was informed that in my opinion she had sarcoma of the antrum; she was told of the advantages and disadvantages of operative treatment; and probably my picture was very discouraging and for that reason she declined operation. The case was considered as certainly malignant by everyone who saw the patient.

I understand this woman was later treated by the roentgen-ray, cautery, caustics, etc. She returned to me just five years afterward with the mass still present and with a large scar on her cheek. This was early in the development

of the roentgen-ray and part of the scarring was probably due to the application of that agent. After an examination I was forced to change my opinion about the growth being malignant, because of the length of time which had elapsed, and proceeded to operate, removing a large dentigerous cyst from the superior maxillary bone. The nature of the growth could most likely have been determined at my first examination had it been possible to make a satisfactory skiagram at that time. The patient recovered promptly and I am glad to say she is still living. This case shows how easily one may be mistaken in the clinical diagnosis of a tumor about the face. Several lesions occurring about the superior maxillary region must be differentiated, and this is not always an easy matter. For instance in the case reported Dr. Dabney had every reason to believe there was simply an inflammatory lesion involving the antrum. It should be remembered, however, that in cancer of the antrum there is a great tendency to obstruction and there may result of coexisting suppurative inflammation. I believe that is what happened in Dr. Dabney's case.

I have seen a number of malignant tumors of the upper jaw and such cases are more susceptible to surgical treatment than is ordinarily believed. Most surgeons seem to think that the hemorrhage and shock will be terrific, and for that reason they consider the operation exceedingly dangerous. Removal of malignant tumors from the superior maxillary is not so difficult as many surgeons believe. My experience leads me to state that operative intervention is safe in the majority of cases, and if the diagnosis of malignancy is made early something can be done surgically for the relief of the patient. Doubtless all surgeons will agree that a malignant growth in this situation particularly should be attacked before the bony wall is destroyed and before it has had a chance to be transplanted by metastasis to distant parts. We must remember that this structure is very near the "center of life" and therefore when malignant disease has advanced beyond the bony wall it becomes a very serious proposition.

A few words may be permitted in description of the operative method which has been found safest for the patient and easiest for the surgeon, i. e., the Ferguson operation. Incision is made parallel with the lower margin of the orbit, extending along the side of the nose around the ala, and finally dividing the lip in the midline. All dissection of skin and soft tissues is completed prior to invasion of the mouth. By clamping the vessels on either side at the angle of the mouth the circulation is controlled in such way that dissection can be made without loss of blood. After the malar bone has been divided the nasal bone and palate are easily broken by

means of strong pliers. The pterygoid process is then grasped with forceps and the entire mass is easily removed. If the tumor is large hemorrhage may occur, but it is easily controlled by packing and finally by actual cautery. In operations upon the upper jaw for malignant disease it is advisable to use the actual cautery and thoroughly cauterize the stump from which the tumor is removed. The suturing is completed immediately, placing the skin in proper position and the cavity is packed with gauze. By this plan of procedure the operation is much less serious than it would appear at first consideration. The gauze is removed in a short time and the patient's mouth is kept thoroughly clean. Following the operation I believe the x-ray or radium should be employed. In all cases of this kind operative intervention should be instituted early.

I have operated several times for sarcoma and once or twice for carcinoma of the upper jaw and the patients are still living after three to eight years. If the growth has advanced to the stage where the cutaneous and glandular structures are involved before operation is undertaken, the patient will probably not live more than a year or a year and a half at the most.

S. G. Dabney, (closing): Dr. Sherrill's statement is most likely correct that the patient in the case reported had suppurative inflammation of the antrum of Highmore coincident with malignant disease. When he first came under my observation the tissues outside the antrum were already involved and there was a large mass in the cheek.

Simply as a matter of historical interest I may mention that the lamp which is now employed for illuminating the accessory sinuses was first used for the diagnosis of tumors of the antrum by Herying, of Warsaw. Its field of usefulness was at that time thought to be limited to the diagnosis of such tumors, but it is now almost universally used for illuminating the antrum and accessory sinuses.

Toxicologic Study of Some Alcohols.—The toxicity of the normal alcohols—methyl, ethyl, butyl and amyl—Macht says increases with their place in the aliphatic series, as indicated by the lethal dosage for cats, and by their effects on isolated frogs' hearts and plain muscle preparations. The secondary propyl, butyl and amyl alcohols were found to be less toxic than the corresponding primary alcohols. In discussing the toxicity of alcohols, Macht states a distinction should be made between the acute or immediate, and the secondary or remote effects of the drugs, as is well illustrated by the studies on methyl and benzyl alcohols.

TUBERCULAR DISEASE OF THE HIP JOINT; AN APPEAL FOR EARLIER DIAGNOSIS AND TREATMENT*

By JOHN D. TRAWICK, Louisville.

This paper is to be an appeal for the adoption of whatever means there may be at hand to prevent all the preventable devastation of tubercular disease of the hip joint.

It is accepted at the outset that what may be called preventable in one case might have been inevitable in another, and that it is difficult to draw hard lines between success and failure in the treatment of this disease. But after observation of a large number of these cases one must conclude that if the treatment were as generally adopted as the symptoms are classically known, there would be correspondingly less of disaster to report in the after results.

Next to tubercular disease of the spine in children this disease takes second place as the most common and most important affection of the joints. Tabulations of thousands of cases of tubercular disease have been made, showing Pott's disease in the lead, hip joint affections second and the other joints third in number. Incidentally it has been found that in one series of 1,000 cases reported by Whitman over 88 per cent were in children under ten years of age. Many hundreds of text books and perhaps tons of papers like this have been written to call attention to the well-known symptoms, signs and proofs of existence, of this disease.

It is not that the affection is obscure, or little known, or hard to recognize. It is not rare. It must be remembered that this is a chronic disease, that many of the classical symptoms are not evident until long after the tubercular focus has become deeply fixed in the hip joint area. If the route of approach to the joint cavity may have been through the synovial membrane first, then into the bony structures and cartilage, by the time the pain and limp and limitation of motion were evident, the stage that might have been called acute, had long since been passed. If the route of invasion may have lain through the bone, and the epiphysal part was the first involved then it must be accepted that by the time the child began to complain of the evidences of hip joint disease the affection had already become deeply rooted. Recall the cases in your own experience, and you will find that most all if not all, will give a history of a fall or blow, or of some accident as the possible be-

*Read before the Jefferson County Medical Society.

ginning of the hip disease. It is doubtful however, if the fall or traumatism was more than a precipitating factor. Rarely could a fall be counted directly responsible for the development of the trouble. It may have brought it to a crisis, and the deep seated infection of tubercular nature broke through the limiting defenses and began its invasion of the joint structures after the traumatism made the opportunity.

Again, a child suffering from hip joint disease is sick from a profoundly debilitating affection, and when the symptoms become recognizable the constitutional shock is evident in any number of ways. The anemia, the debility, faulty appetite, loss of sleep and other constitutional strain impress us with the fact that the child is losing ground.

There is one class of physicians who must be called here into account. The fact of the disease has been recognized, a correct diagnosis has, in general, been made, hip joint trouble has been demonstrated. But here the good work has stopped. Instead of instituting at once the active defense measures to be spoken of later, the opinion is expressed that not much can be done with the child, the disease will have to run its course, it will be deformed, no matter what is done for the child.

Very little can be said in extenuation of the criminality of such an attitude. But we can give them the benefit of the doubt and suggest that perhaps these doctors have been sincere in their attitude. Perhaps after all they have recognized the facts outlined, that this is already a chronic disease deep-seated, and well on its mischievous way and that the child is so debilitated that it has very little resistance with which to fight the affection. In other words, these doctors may belong to a large class of pessimists in the profession, who actually go into the fight against some diseases already whipped. They may honestly believe the child is doomed to a losing fight, to a general tuberculosis, and death as a result of this hip joint affection, or if not that then at best, to years of disability, and ultimate deformity no matter what is done.

If the fight against a spell of pneumonia were undertaken in such spirit how many of this doctor's pneumonias would get well? If our attitude against any serious ailment to which the human constitution were liable should be characterized by such a spirit we could never lay claim to the glorious heroism that is a birth-right of the profession. Further, is it not likely that this doctor is more familiar with the symptoms of hip joint affection than he is with the treatment.

There is possibly not a disease more easily

recognized, nor one in which the signs have been more carefully analyzed, and yet withal, we hear yet of the persistent treatment of rheumatism, when the very fact that the little fellow didn't get well should have been enough to convince the doctor that he had more than an acute thing to deal with. The fact of the single joint, that it was the knee joint too, and that there was no swelling nor redness, nor evidence about the knee joint to lead one to believe that the knee joint was responsible for the trouble, should have led to a deeper investigation, to a search of the premises.

It is not unlikely that that child had been complaining for some time of pain in the region of the knee, yet if this location had been searched the pain could have been outlined in the region supplied by the obturator, or by the sciatic, or perhaps the pain could have been traced to other distributions of nerves as the crural, or the gluteal, all of which you remember supply the hip joint.

Or there may have been a limp which the parents had noticed for some time, and stiffness of the leg, particularly, in the mornings. The child very likely had been sleeping restlessly, crying out at night, with bad dreams or night mares, and the cry was of a very peculiar hollow character, unnatural, and as if in pain, even though asleep.

If the investigation were pushed, there would be more and more evidences to lead away from the rheumatism, or growing pain theories. If the attitude of the child were studied it would be found that he tired easily, stopped frequently in his play to rest, and that this resting attitude was such that the suspected limb was always favored. Frequently the hands would be placed on the thigh of the affected limb to hold the weight of the body away from the hip joint, and to produce extension, though the child did not analyze the position. On lying down, invariably the well foot would be called upon to protect the leg that hurt and in the early stages it would be seen that the well foot would be placed below the other or sick foot, in order to fix the leg, and prevent motion of the hip. Later this would be changed, and as the disease progressed the well foot would be actually placed so as to secure extension of the leg that hurt. The leg of the affected side would be found to be in abduction with flexion at the thigh, the position of protection.

Let the patient lie down on his back, and the muscle spasm could be even more easily demonstrated. Flexion of the thigh would meet with resistance, rotation either in abduction or adduction would be difficult, and accompanied with pain.

Attempts to flex the thigh on the abdomen would be resisted, and extension would bring the pelvis upward and forward as though the hip and pelvic bones were welded together.

If further evidence were needed to disprove the rheumatism theory, it would be interesting to see the ease with which all these motions could be done under a few whiffs of chloroform, for then the muscle spasm would be relaxed, the pain in abeyance, the irritation stopped, and it would be seen that the limitation of motion was purely an effort at protection of the inflamed joint.

Our pessimist could very easily stop here. He could give his distinguished opinion to his colleague who had perhaps called him in consultation, and say let nature take its course, nothing to be done, long spell ahead anyway you looked at the case, child going to suffer no matter what you did, and with that mark up another call, and go on his way. But there are not many of his kind.

Suppose, however, this case had been allowed to go untreated, or with inadequate treatment. This does not imply criticism. Even the most careful treatment of these little sufferers sometimes fails to arrest the disease. As the disease progresses fluid is found in the joint cavity, the efforts at protection are more obstinate, flexion of the limb is habitual and efforts to keep the head of the bone from impinging on the acetabular cavity are more constant. With every impact the child cries with pain, and the whole attitude is now one of defense from suffering.

The x-ray is an indispensable ally. The most usual sites of erosion are seen at the point of impact between the upper margin of the head of the femur, and the corresponding portion of the acetabular rim. Destruction of bone may be seen along the epiphysis, or involving the rounded head of the bone itself. As the process continues the bone crumbles, or the neck may give way and the head be loose in the cavity, only later to break up and be absorbed into the debris and fluid that now fills the joint cavity. Change in position of the limb now takes place. Adduction with flexion and shortening. If weight bearing has continued the head of the bone gone the shaft of the femur impinges against the acetabulum, which has very likely become eaten out and eroded by the tubercular process. As the cavity is rimmed out, shortening naturally increases, from the "wandering acetabulum," until actual luxation may occur, the head of the shaft of the femur, riding high up over the upper rim of the cavity. Here extreme adduction with flexion deformity is noted and the child is a pitiful cripple.

The abscess cavity has gone on its destructive way the fluid finding whatever points of weak resistance it may, burrowing down along the adductor tendons to find an opening on the inside of the leg, or outward under the glutei, to point over the space between the great trochanter, and the anterior spine, or backward and downward toward the perineum, or perhaps inward and through the acetabular cavity, into the pelvis, into the bowel and out by the intestinal route.

If there can be produced case upon case to show arrest of the process even at this stage, though with deformity might not the case for the early treatment be strengthened? How much more logical to begin at once the defensive measures. No elaborate outfit is needed. Armed with an unquestioning anatomical knowledge of the parts involved, and of the pathology, one can give relief to these little sufferers with a few rolls of plaster of Paris bandages, some sheet wadding or cotton, and a careful application of a well-fitting cast. Let the limb be brought in to abduction under an anesthetic, for it is not easy, but painful to overcome the muscle contraction, extension to a moderate degree, with partial flexion at the knee joint, being sure that the foot is held at a right angle to the leg. With an assistant holding the leg in this position the cast can be applied, and then trimmed out at front and back to avoid pressure, and soiling.

This is by far the easiest and most practical dressing for most cases of hip joint affection.

The treatment of convalescence will have to be taken up at another time, as well as the management of deformities. The case can be closed for the early attention to these little sufferers, with the statement that in most instances if seen early and the process of treatment, from cast to brace, and crutch, and weight-bearing, finally to both feet on the ground and walking without support has been time and again brought within two years time, and in some instances to less than twelve months.

If the same reasoning that has been applied to tubercular disease of the lungs could be applied to tubercular disease of the joints, might it not be hoped that some day we will be able to perfect our radiographie so that we can detect bone changes long before erosion and change of physical contour has taken place. In other words there is a stage of the disease in hip joint disease which must be just as strategic for ultimate cure, as is the stage of pulmonary tuberculosis, which lies far in advance of the development of the gross lesion, when much of the fighting opportunity has been lost.

AN UNUSUAL FOREIGN BODY IN THE
URINARY BLADDER*

By H. J. FARBACH, Louisville.

C. M. J., male, aged thirty-eight; married; father of four children, youngest aged five months. General physical condition and health of the patient had been good. Venereal history: exposed to syphilis, but Wassermann negative; has had three attacks of gonorrhea, each of long duration, last attack four years ago; he stated that he was treated by a physician at that time with strong solution of zinc sulphate and lead acetate.

Present history dates from one year ago: The only symptoms complained of were: First, pain in perineum radiating to sacral region; second, diurnal but no nocturnal pollakiuria. The patient said he had never voided any blood with his urine so far as he knew, had slight "unnatural sensation" at beginning, but no sense of discomfort or incompleteness at end of micturition. The urine was pale, turbid, and had a peculiar rancid odor; no residual urine in bladder. Chemical examination of urine negative; microscopic findings negative for everything excepting pus; reaction decidedly acid. Numerous examinations of sediment failed to disclose any evidence of tuberculosis; guinea pig inoculation negative. Subcutaneous injection of tuberculin did not produce typical reaction. Culture and staining of urine showed bacillus coli and large acid producing bacilli. Prostate and seminal vesicles negative. Endoscopic examination revealed edematous highly congested posterior urethra and vesical neck; posterior urethra extremely sensitive.

Treatment directed toward the posterior urethra and vesical neck did not afford the customary relief; but after about two weeks seemingly aggravated former symptoms and gave rise to another which was described by the patient as follows: He said that he would have a desire to urinate, but was unable to start the stream; after considerable straining and pain he would assume the recumbent posture when there would occur a sensation of "something being drawn upward into the bladder," that he would then rise and urine was voided spasmodically. He said this performance had to be repeated several times before his bladder could be completely emptied.

Cystoscopic examination disclosed an inflamed trigone and edema of vesical neck; both ureteral orifices normal and clean, clear urine being ejected at regular intervals. Just pos-

terior to the ureteric ridge was a grayish mass with rounded (mammilated) surface about 5 cm. in diameter which could be easily moved about with the cystoscope. Raising the reflector and striking the mass sharply separated a fragment, but this could not be recovered by subsequent washings. Two items were noted during the examination: First, that the customary "click" from contact of instrument and calculus was absent; second, that the mass seemed very friable. However, a diagnosis of vesical calculus was made and operation suggested.

The patient came to see me again about a week later and reported that during the forty-eight hours following cystoscopy he had voided a number of "pieces of something," one of which he presented. This object was about the size of a small bean, grayish in color, very friable, and when rubbed between the fingers disintegrated completely as a gritty, greasy, smear, having the same peculiar rancid odor previously noted in the urine. On closer questioning the patient admitted that four years ago during his last attack of "gonorrhea" he had supplemented his physician's treatment with a course of patent medicine known as "Zip." He said this came in the form of bougies which he inserted into the urethra and insinuated backward into the bladder.

At subsequent cystoscopy the entire mass was disintegrated with forceps and removed by irrigation, thus proving that the supposed vesical calculus was composed of some sort of fatty substance with a melting point considerably higher than the body temperature.

I consider this case of some interest for the following reasons:

First, that whenever an ointment or fatty substance is introduced into the posterior urethra or placed on the trigone one must be sure that its melting point is below body temperature. Second, this foreign body had remained in the vesica urinaria for two years without producing any symptoms. Third, that in three years no urinary salts had been deposited around this mass. The case further shows that not every supposed "vesical calculus" is really a calculus, and even when such a diagnosis seems certain upon cystoscopic examination it is advisable to employ forceps as a means of verification.

On last cystoscopy, three weeks after removal of the foreign body, most of the edema around the vesical neck and in the posterior urethra had disappeared.

I might add that this patient presented a rather unusual congenital anatomic defect of the posterior urethra as described by Young, Frontz and Baldwin in the *Journal of Urol-*

*Clinical report read before the Jefferson County Medical Society.

ogy for October, 1919. There were two or three bands extending from the verumontanum across the urethral lumen, and perhaps this obstruction had something to do with the accumulation of this mass of fatty material in the vesical cavity.

TABES DORSALIS IN FEMALE AGED TWENTY-NINE, CASE REPORTED.*

By S. W. BATES, Louisville

This patient is Mrs. M. L., aged 29, occupation restaurant worker. Her family history is negative. She states that she had the usual diseases of childhood, but no subsequent illness until beginning of present trouble. She is the mother of one child, now ten years of age, and reported to be in good health. She gives the history of an initial sore seven years ago, followed by secondary eruption, for which she received treatment at the time. The nature of the treatment and duration cannot be ascertained. However, she has had no treatment during the last four years.

This woman appeared at the out-patient department of the Louisville Public Hospital on January 15, 1920, complaining of "pains all over her body," especially in the lower limbs, and some "stiffness of her back." She said she had suffered more or less from sharp, stabbing pains in various parts of her body for the last two years. During the past year she had noticed a tendency to stumble while walking at night, but experienced little or no trouble during the day.

About four years ago she had double vision for a few days, for which she consulted a specialist, but the symptom disappeared without treatment. She has never had any girdle sensation nor any form of crisis, but at times has had a feeling of "pins and needles" in various parts of her body. There is entire absence of knee jerks, also typical Argyll-Robertson pupil, and marked Romberg sign; no history of vomiting nor throat spasm. Wassermann blood reaction January 17th, reported three-plus positive. Since January 20th, she has received intravenously two doses of arsphenamin and four of neoarsphenamin, with marked diminution in painful symptoms.

This case is presented not because of anything unusual in itself, as it is a typical one of tabes dorsalis, but simply on account of the sex and age of the patient and the early appearance of tabetic symptoms.

DISCUSSION:

Malcolm Kemper: In a case of this kind would not greater benefit accrue from intra-spinous administration of arsphenamin than from routine intra-venous injections?

C. G. Hoffman: It was formerly believed nerve lesions developed only during the late stages of syphilis. We now know, however, that the nervous system may be involved at any time during the course of the disease. I have recently had under observation two patients who had double vision during the early secondary stage. The cerebro-spinal fluid is not infrequently found positive to the Wassermann test early in the course of the disease, and careful examination will often reveal nervous lesions.

In some instances cerebro-spinal syphilis will respond more readily to intra-venous than intra-spinous administration of arsphenamin, and vice versa.

I now have under observation a female with tabes dorsalis whose tabetic symptoms appeared within three years after the initial lesion. Cases of this kind are not so rare as hitherto believed.

SURGICAL ADVANCE*

By W. E. SENOUR, Bellevue.

The greatest conflict of the centuries has passed. As we assemble today for the first time since that heroic struggle, it is eminently fitting that we unite in splendid tribute to American surgeons and to our colleagues throughout this great country, who have freely given their service and their lives in the cause of human liberty.

It is impossible to speak in too high terms of the character of the personnel of which the American medical forces was composed. Those men were imbued by that professional spirit which has ever caused them as a class to ignore danger, fatigue, and inconvenience of every kind in the performance of duty.

We welcome today with outstretched arms those patriots that served both at home and abroad. For those heroes we have but one sentiment, cheers for the living and tears for the dead.

The memories of the past and the pleasures of the present combine to give this meeting a special spirit in which interest, pride, affection and anticipation unite to form a union that brings us closer together than ever before.

A glorious victory has been won, we may now turn our thoughts as surgeons to garner its lessons, estimate its results and apply its

*Clinical report with exhibition of patient before the Jefferson County Medical Society.

*Read before the Kentucky State Medical Association, Ashland, September, 1919.

teachings. I am aware that the time is yet too short to fully appreciate them in their proper relations or judge of their ultimate influence upon the surgery of the future, of the many important contributions that have been produced during this conflict those pertaining to surgery have been most characteristic and productive of important results. They impressed upon the treatment of wounds a new evolution that marks the beginning of a new era in surgical methods and surgical technique.

While it is true that no new surgical principles were discovered, it is equally true that the long established principle discovered by Pasteur applied by Lister upon which modern surgery rests, have emerged triumphant from a test the equal of which we may never see again.

Through the organization and cooperation of the medical profession and the thorough and precise application of principles already known resulted in the advent of two great surgical developments, viz: debriedement and the Carrell-Dakin method of treating wounds which rendered possible the primary closure of contaminated wounds and made feasible secondary suture of once infected wounds.

The practice of debriedement on an extensive scale was first proposed by Col. Gale, of the British expeditionary forces and later popularized by Lematri, while many other antiseptic solutions were tested in the crucible of experience all of which had their advocates. Yet the testimony of many that we know whose surgical skill and judgment and whose powers of observation are not open to question compels us to regard the Dakin solution and the Carrell method of application as one of the important developments of medical science in the late war. While Lister taught us how to prevent infection, Carrell and Dakin taught us how to conquer the most virulent infection. For nearly half a century, surgeons everywhere have been fighting entrenched infection without results. It remained for the stern stimulus of war to enable us to win the victory, so that today both prevention and cure are ours.

De Page, of Le Panne, Belgium, reports 80 cases of compound fracture treated by the Carrell-Dakin method without one drop of pus. Tuffier says that 80 per cent of all amputations are due to infection.

With this method of treatment most of these mutilations will be avoided. In 160 cases of industrial accident in one of the Philadelphia hospitals treated by this method, all were discharged in one-third of the time required by former methods. What particular feature of this method is the most potent is immaterial.

Whether it is the mechanical cleansing of the wound known as debriedement, or the physiologic or antiseptic effect of the solution itself. It is my opinion that as debriedement comes more into general use the less will be the demand for the Dakin solution. After using this solution according to the method of Carrell in both hospital and private patients for the purpose of testing its value, I am convinced that the success of this method depends almost entirely upon the precision with which it is carried out. It is the precise technique with which the mechanical cleansing is done, the precision with which the solution is prepared and again the thoroughness and precision of its application to the open wound the contribution of military surgery may be best expressed by two terms, prevention and precision. The manner in which those extensive lacerated wounds, accompanied by the most virulent infection were mastered and overcome, and the ultimate success of surgery attained, forms one of the most triumphant chapters in the history of surgery. The accumulated statistics have demonstrated that more than 93 per cent of all the wounded that lived to come under surgical care recovered, and that 70 to 80 per cent of all casualties were able to return to duty within two months.

The value of asepsis in abdominal surgery first introduced by Crile and his associates, has been amply demonstrated to be of inestimable value by the experience of Capt. Douglas Taylor and associates in an English base hospital, whereby the mortality was reduced from 50 to 9 per cent. Judging from my own experience and the testimony of others employing this method I am convinced that asepsis in abdominal surgery marks a new epoch in that field. It will likewise bring into greater prominence the psychic element in its relation to surgical cases and surgical results.

The good surgeon has learned how far the mind of the patient influences the progress or the suppression of the disease. He is rapidly learning the essentials of recovery in the condition, habits and environment of the patient, no matter what the diagnosis may be. He recognizes these obstacles and removes them if possible before attempting surgical treatment. He is also learning how essential conditions of toxæmia, anaemia and other pathologic states must be considered in the problem of a cure, but the most valuable lesson is that the prime problem in all surgical conditions is the problem of the patient. He has also learned the absolute necessity for pre-operative treatment in all surgical cases not classed as emergencies. If patient be anaemic, gives blood transfusion. If an alcoholic,

he must become a total abstainer before surgical intervention is attempted. If suffering from fear and anxiety as to the final outcome, must be placed in an atmosphere of quiet and confidence, number of hours for sleep must be increased and the working hours filled with contentment. If suffering from low blood pressure, must be corrected by transfusion.

The contention of the civil surgeon for immediate intervention in all penetrating wounds of the abdomen has been upheld by the experience of the military surgeon. Many of our doubts in chest surgery have vanished. The fear of pneumothorax is no longer present, the negative pressure cabinet so much in vogue a few years ago is no longer considered necessary. It has been well established in the military service that the chest may be opened freely and the lung handled without great danger. Unless excessive hemorrhage renders it an emergency, watchful waiting should be the rule in most cases of chest surgery. The final reports upon the study of empyema which was very prevalent in the camps, has placed the treatment of that complication in a clear light.

A great change for the better has taken place in the results obtained in the treatment of wounded joints. The greater part of that experience was gained by a study of the knee joint as it was the most frequently struck. The first advance was the abandonment of the intra-articular drain, the second the excision of the wound and removal of foreign body, third, the flushing of the joint and immediate closure. In all cases of injured joints immobilization has been replaced by active mobilization.

As a result of this conflict the treatment of fractures has been stabilized by the standardization of splints and other apparatus for immobilization. The Thomas knee-splint is the one, most favored for fractures of thigh and leg, both for transportation and after treatment.

The results achieved in plastic surgery of the face and jaw are striking examples of what may be accomplished by surgical team work. The results obtained in this war have demonstrated most forcibly that Maxillo-facial surgery is not the province of the general surgeon alone, but of the general surgeon, co-operating with the dental surgeon, the ophthalmic surgeon and aural surgeon. Efficient co-operation is a necessity for successful results. There must be team work in which all are stars if you would give the patient the best chance to recover.

In brain surgery war has demonstrated that immediate and incomplete operation is no

longer feasible, cranio-cerebral wounds as a rule, present no immediate urgency, for a tissue the brain is notably tolerant of contusions and infections. All wounds should be carefully cleansed, edges resected, the opening in bone made large enough for thorough inspection. The dura should never be opened except to remove blood clots or disorganized brain tissue. The dura should be closed immediately to prevent fungus cerebri. Combined with this all brain cases should have a long rest, both mental and physical. The prime object to be attained in the treatment of cerebral wounds of the brain is the prevention of intra-dural infection. Penetrating wounds of the brain should always be treated conservatively. If the surgeon, by seeking to extract a retained missile does more harm than the missile it should not be removed.

The prophylactic treatment of tetanus by the employment of antitetanic serum has been verified by the results obtained during the late war. Carroll G. Bull and Miss Ida Pritchard of the Rockefeller Institute have immortalized their names by the discovery of an antitoxine for gas gangrene. It has revolutionized our knowledge of the pathology of gas gangrene and its cause. It has proved as potent when used early for gas gangrene as diphtheria antitoxine is for diphtheria.

The conclusion of the Inter-Allied Surgical Congress as regards shock is that the best treatment of hemorrhage and shock is rest, warmth, fluids, morphia for pain and blood transfusion. They favor nitrous-oxide oxygen as the safest and most efficient anaesthetic. A large part of the successful surgical results were due to efficient hospital organization, combined with the practical cooperation of the clinicians of the various specialties with the workers in the laboratory. Then let us not permit its great value to go unappreciated by those responsible for the conduct of civil hospitals, the bacteriologist, the pathologist, chemist and clinician must come in touch with the patient and the problem of the patient.

The experience of those engaged in military service has given certainty to the fact that mechanical cleansing of a wound has greater basic value than attempts at chemical sterilization, it has strengthened our belief that the tissues of the body and the fluids possess in themselves wonderful powers of resistance to infection if only the contaminating agent and the traumatized tissues are removed. One of the greatest surgical lessons of the war is that the best antiseptic is the careful removal of devitalized tissue without injury to the healthy tissue by handling gently, lovingly and with dispatch.

The good surgeon is aware of the fact that the pathological condition that calls for operation gives rise in the majority of instances to fear and misgivings, resulting in a state of chronic anxiety which must be relieved by suggestive therapeutics during the post-operative treatment.

The careful study of the subject of shock, with its demonstration of the possibility of carrying on immediately behind the line of battle such a procedure as blood transfusion, the almost universal use of antitetanic serum to forestall tetanus, the practical establishment of details whereby sepsis was controlled, the universal adaption of methods of early surgical resection of wounds, whereby they were converted in clean wounds, the ultimate healing of which was materially shortened and those brilliant results obtained by the surgery of various regions, surgery of the brain, the face, the abdomen, the extremities and of the chest, as a result of which the thorax, practically a closed area to surgical effort, was demonstrated to be as promising a field as any other part of the body. All of these have already been the subject of intensive studies, and in each department contributions have been made that will promote surgical advance of the future.

The exigencies of the war have produced many modifications and adaptations of surgical technic. The details that form the chapters in war surgery will ever be of the highest importance, not only as presenting surgical effort in its most exalted phases, but in addition to this it furnishes us with a lesson of supreme value in directing the surgery of the future. The experience gained by the surgeon in military service is invaluable, has aroused their surgical spirit, has strengthened their confidence, broadened their experience and increased their interest in the solution of surgical problems.

Method, prevention, precision and greater thoroughness are coming to characterize the surgeon of today, our horizon is ever broadening, our views and our practice has undergone and is still undergoing radical changes, as time sweeps on the old passes away and the new becomes old, the impossible of yesterday becomes the possible of today.

DISCUSSION:

R. C. McChord, Lebanon: It is not expected that anyone can in five minutes dissem this valuable paper, and consequently there is only one point to which I desire to call attention, namely, when this war broke out the success of antiseptic surgery was to a limited extent established. As surgeons, we began to realize that we could not do aseptic surgery without the use of

antiseptics, but the war has emphasized and taught us, and especially those of us who deal with railway surgery, that we cannot do without antiseptics and do good surgery. Our eyes have been opened to the fact that we must not attempt to do surgery of a certain kind without antiseptics.

The Carrel-Dakin method has shown that we can deal with surgical conditions in cases that were formerly doomed to amputation.

I want to relate one case which illustrates the advantage of the Carrel-Dakin method of treatment in connection with one of the most difficult problems we have to deal with, and that is the open knee joint. We all know that formerly in those cases in which the knee joints became infected, they were almost invariably doomed to amputation. The patient whose case I wish to report was a young man who had opened his knee joint by a fall on a scythe, really amputating almost half of the left knee joint.

He severed the patellar tendon just below the knee cap. He lived in the country; but the doctor who saw him did not have the proper facilities to deal with it. The result was the whole joint became infected, and he was brought to my hospital a week after the injury. He had about a half pint of pus oozing from the wound. The whole joint was open. Formerly we were inclined to amputate in such cases. There was about an inch and a half of the lower end of the inner condyle cut off entirely and lying in the wound among the pus. To make a long story short I was enabled to cure this joint by the Carrel-Dakin method and get a good result. With the exception of the absence of that piece of bone which allowed it to careen to one side, he has almost a perfect joint as a result of that treatment.

I want to impress upon you the necessity of using antiseptics in the treatment of this character of wounds and what can be accomplished with this treatment.

Horace Rivers, Paducah: Did I understand you to make the statement that there was an inch and a half of the lower end of the femur cut off?

R. C. McChord: Yes, inner condyle transversely and I think I got an almost perfect joint, with the exception that it careened a little to one side, but by the application of an elastic apparatus he can walk almost perfectly.

W. L. Gambill, Jenkins: I have nothing to add to what has been said, except to say that Dr. McChord is to be congratulated upon the results he obtained in his case.

F. P. Strickler, Louisville: I wish to congratulate Dr. McChord upon the results he obtained in the case reported. Outside that I have nothing to say.

THE FALLACY OF SINGLE URINARY ANALYSIS.*

By J. ROWAN MORRISON, Louisville.

I have always believed that the analysis of a single specimen of urine was quite apt to lead to erroneous conclusions, and to illustrate this point the following case is briefly reported.

Five years ago I first saw Mrs. L., who was then sixty-nine years of age. She had previously had several uremic convulsions and was evidently suffering from the ordinary type of interstitial nephritis so frequently seen. She was given the usual remedies supplemented by hot packs, etc., and made a good recovery.

During the last five years I have examined single specimens of her urine from time to time and found no albumin nor casts. However, a twenty-four hour specimen always showed a low specific gravity (1004.8) with a moderate amount of albumin and a few hyaline casts.

On December 28th, 1920, this patient was admitted to a local hospital, not because she was acutely ill, but she said she wanted to stay in the hospital for a while. Routine urinalysis showed the following: specific gravity 1013, albumin, sugar and casts negative, i.e., a perfectly normal specimen of urine.

I then became interested in trying to determine whether it was a fact that the kidney had returned to its normal condition, and asked Dr. John W. Moore to do some blood chemistry work in the case. His report showed: urea nitrogen 13.65, mgs to 100 c.c. of blood; non-protein nitrogen 32.7 mgs. to 100 c.c. of blood; creatinin 1.15 mgs. to 100 c.c. of blood; uric acid 3.18. It will be noted these are all well within normal limits. Examination of a twenty-four hour specimen of urine showed: total quantity 1695 c.c.; specific gravity 1010; albumin a trace; sugar and casts negative; total nitrogen excreted 5.847 grammes; percentage 34 per cent. All these are practically within the normal range, except the percentage of nitrogen was low; but we have to consider that the patient was then on a low protein diet, which would make it about normal.

My reason for mentioning the case is this: Here is a patient we know had nephritis, she had uremic convulsions, yet examination of a single specimen of urine was perfectly negative. It is unsafe to judge by the examination of a single specimen of urine whether or not there is disease of the kidney. In my

opinion this confirms a point I have always thought of great importance when the physician cannot avail himself of elaborate blood tests and refined urinary tests, that is a fixed low specific gravity of a twenty-four hour specimen of urine is always indicative of renal disease. It is remarkable how few of us examine twenty-four hour specimens of urine and use the findings thus obtained as a basis for estimating the condition of the kidney. It is even difficult to get those in charge of hospitals to do this.

The blood examination shows that the patient has reduced her protein intake to a low point, in consequence her kidney has been spared and she has remained in fairly good condition.

DISCUSSION:

John W. Moore: I saw this patient in 1916, and agreed with Dr. Morrison that she had uremic manifestations. No blood chemistry work was done at that time. It was considered that she had nephritis and treated as such. The present blood and urinary findings indicate that the patient is being treated properly for nephritis so far as we have. However I do not believe her renal apparatus would be able to take care of a heavy protein diet, and undoubtedly the method of treatment Dr. Morrison has instituted has enabled the patient to take care of the character of food that is given her.

C. W. Dowden: I have said repeatedly, and believe it is true that I would rather have a twenty-four hour (forty-eight hour or longer if possible) chart of the patient's urinary output with a record of the specific gravity than the blood chemistry. I no longer require the collection of twenty-four hour specimens but have the patient save every voiding in individual bottles for a two-day period regardless of time or the ingestion of food and these are brought to my office. I have encountered no difficulty in having a similar plan followed at the hospital. Every specimen of urine voided is carefully measured and the specific gravity recorded on the chart. I can then easily determine the twenty-four hour quantity. I have found no difficulty in having this done for days or even weeks when necessary, where possibly a request to save the urine in a vessel for twenty-four hours might have been disregarded. Each voiding is measured and the specific gravity immediately recorded. In this way I always have a complete record of what kidney is doing—I wish to repeat that I would rather have knowledge of the quantity and specific gravity of each voiding for a two-day period than the blood chemistry. I have found furthermore, in a series of quite a number of cases where the findings have been carefully checked, that I would more frequently get evidence of kidney disease or disturbed func-

*Clinical report before the Louisville Medico-Chirurgical Society.

tion from the specific gravity than from blood chemistry methods. However, where there are clinical symptoms referable to the kidney the blood chemistry findings are important and will show evidence of renal disorder.

In the case Dr. Morrison has reported nothing was said about the blood pressure or the state of the arterial system of the patient. I have usually found where the kidney was primarily involved there would be a disturbance of function which would be reflected upon the chemistry of the blood.

J. R. Morrison, closing: This case was merely reported to emphasize the uncertain knowledge one gets from the examination of a single specimen of urine. I agree with Dr. Dowden that the plan he has outlined is better than collecting twenty-four hour specimens of urine. I do not believe many physicians avail themselves of the information to be obtained from a record of the quantity and specific gravity of specimens of urine over a period of several days.

A great many men would have said in the case I have reported that there was no kidney disease because urinalysis showed the urine to be practically normal. As a matter of fact, however, the urine was not normal as there was a persistent fixed low specific gravity.

I have nothing further to say about the blood chemistry.

Treatment of Tropical Ulcer.—The operation the sloughs and softened tissue with Valkmann's spoon. When a firm base of sound tissue has been obtained, the undermined edge of skin is cut away with scissors curved on the flat, so as done by Howard consists in scraping away all to leave no pockets. Any ragged pieces of fibrous tissue that remain in the base of the ulcer are then cut away with scissors. The surface is washed over with an antiseptic, and then dressed with cyanid gauze and some antiseptic wool, and firmly bandaged. The first dressing is done forty-eight hours after the operation.

Rabies Vaccine.—A. M. Stimson, Washington, D. C., (Journal A. M. A., Jan 22, 1921) calls attention to the fact that rabies vaccine, prepared by various procedures, is now available throughout all portions of the United States to the extent that it may fairly be said that no exposed person need die of rabies for lack of injections. Many state boards of health are prepared to furnish it free of cost to the indigent, and the cost of the commercial preparations is not prohibitive except to the destitute, for whom other provisions could probably be made in almost every instance.

IN MEMORIAM

At the January meeting, the following resolutions were passed:

In the death of Dr. H. Horace Grant, the Louisville Medico-Chirurgical Society has lost one of its oldest and most loved members.

With the passing of the years Dr. Grant's interest in this society seemed to grow keener and his participation in the proceedings looked forward to by its members. He was a skillful surgeon and a forceful speaker, and our proceedings are the richer for his discussions and papers.

Our hearts go out to those loved ones who mourn his being taken from them, for their loss is an individual loss to each member of the society; and we take this method of conveying to his loved ones, rather than by formal resolution, the deep sympathy each member feels for them at this trying time, and to express the great satisfaction there is to each of us to have known and loved him.

S. G. DABNEY,
W. BARNETT OWEN,
HENRY ENOS TULEY,
Committee.

Bubonic Plague.—Among the fourteen cases of plague reported by Levy and McMiken there were only six deaths, which the authors regard as corroborative evidence as to the efficacy of anti-plague serum in large doses in the treatment of this disease. The cases embraced the bubonic and septicemic forms, and in one case meningitis was a complication. Of the six patients who died, only two received serum treatment, and of these one received only one injection of 50 c.c. before death ensued. The authors suggest that patients with axillary buboes be given much larger initial doses than those with femoral or inguinal inguinal involvement.

The Bladder and Ureters with Uterine Cancer, etc.—Mock and Dore discuss the important services liable to be rendered by cystoscopy and catheterization of the ureters with gynecologic disease, and especially with uterine cancer. The bulging of the bladder wall, displacement of the trigonum or other region, local pulsation, wrinkling, edema, etc., are signs of disease nearby and disturbance in the circulation. Retention catheters inserted in the ureters much facilitate the Ries and Schauta operations for uterine cancer and, if the ureter happens to be cut, render suture an easy matter. In their two cases of rectal cancer in men, not much information was derived from cystoscopy.

Kentucky Medical Journal

PUBLISHED BI-MONTHLY BY
THE KENTUCKY MEDICAL ASSOCIATION
Incorporated

Editorial and Business Office, Cor. State and Twelfth Sts.

Entered as second class matter October 22, 1906, at the Postoffice at Bowling Green, Ky., under act of Congress, March 3, 1879.

Subscription Price\$2.00
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Next Meeting Louisville, September, 1921.

COUNTY SOCIETY REPORTS

Breckenridge—At the regular meeting of the Breckenridge County Medical Society the following officers were elected: J. A. Sandbach, President; R. W. Meador, Vice President; J. E. Kincheloe, Secretary-Treasurer and Delegate, and A. M. Kincheloe, B. H. Parrish, S. P. Parks, Censors.

J. E. KINCHELOE, Secretary.

Clark—The following officers were elected at the regular meeting: E. R. Bush, President; S. J. Rose, Vice President; G. F. Doyle, Secretary-Treasurer; D. H. McKinley, Delegate; I. H. Browne, J. E. Bacon, J. G. Young, Censors.

G. F. DOYLE, Secretary.

Calloway—The following officers were elected at the annual meeting of the Calloway County Medical Society: C. O. Gingles, President; B. B. Keys, Vice President; E. B. Houston, Secretary-Treasurer; P. A. Hart, Delegate; W. H. Graves, W. F. Grubbs, J. V. Starks, Censors.

E. B. HOUSTON, Secretary.

Garrard—The following officers were elected at the regular meeting of the Garrard County Medical Society: W. M. Elliot, President; J. E. Edwards, Vice President; J. B. Kinnaird Secretary-Treasurer.

J. B. KINNAIRD, Secretary.

Franklin—The Franklin County Medical Society met with E. C. Roemele on Tuesday, February 1st, 7:30 P. M., presided over by the President, Dr. Roemele, who acted as host.

Those present, besides the President, were Drs. Jackson, Wilson, Morrison, Garrett, Stewart, Budd, Coblin, Minish, Coleman, Patterson, Heilman and Mastin.

The society had with them as guests Dr. Maguire, Dr. Vance, Dr. Murray and Capt. Walker, all of Lexington.

All the doctors present paid their dues. Other routine business was dispensed with and the time given to Dr. Maguire, who gave a most practical, interesting and instructive talk on the "Proper care of the Milk Supply of a City," from the time it leaves the cow until it reaches the consumer. He told of the latest and best methods of disinfection of cow barns and means used to allay dust and to keep flies away. The doctor has travelled over a great part of the United States in the interests of this subject, that he is making a specialty of, and inspected cow barns through the North, East, South and West and is well qualified to speak authoritatively.

J. D. Maguire also explained fully just what was meant by Pastuerized, Clarified and Certified milk and the number of bacteria it is allowed

to contain to pass the inspector. He told of the duties of the inspector and their desire to help the farmer and the dairyman.

As several of the Franklin County doctors are dairymen, as a side issue, the subject of the management of milk and the selection of cows, met with much enthusiasm and Dr. Magnire kindly consented to answer questions the doctors might care to ask and for an hour he was kept busy and possibly would have been longer if the host's wife, Mrs. Roemele, assisted by Mrs. Minish had not made their appearance bearing a delicious salad lunch with cake and coffee. And Milk was forgotten.

All present voted this the very best meeting the society had had for a long while and extended a cordial invitation to the Lexington doctors to repeat their visit at an early date.

With a rising vote of thanks to Dr. Roemele and his wife the society adjourned to meet the first Tuesday in March.

E. C. ROEMELE, President.
F. W. MASTIN, Secretary.

Hart—At the regular meeting of the Hart County Medical Society the following officers were elected: W. A. Weldon, President; C. H. Moore, Secretary-Treasurer; J. W. Craddock, Delegate, and L. E. Comstock, Censor.

C. H. MOORE, Secretary.

Lewis—At the regular meeting the following officers were elected: H. M. Bertram, President; E. M. Foreman, Vice President; J. D. Liler, Secretary; C. E. Stout, Treasurer; H. W. Edington, Delegate, and E. M. Foreman, C. E. Stout, T. B. Ginn.

J. D. LILER, Secretary.

Metcalfe—At the regular meeting of the Metcalfe County Medical Society the following officers were elected: P. D. Harvey, President; James Taylor, Vice President; H. R. Van Zant, Secretary-Treasurer; J. A. Yates, Delegate; P. W. Bushong, I. R. York, James Taylor Censors. H. R. VAN ZANT, Secretary.

Ohio—At the regular meeting of the Ohio County Medical Society the following officers were elected: P. T. Willis, President; J. D. Stewart, Vice President; Oscar Allen, Secretary-Treasurer.

OSCAR ALLEN, Secretary.

Oldham—The following officers were elected at the regular annual meeting: H. P. Blades, President; C. J. Connell, Vice President; S. J. Smock, Secretary; R. B. Cassady, Treasurer and Delegate.

S. J. SMOCK, Secretary.

Owsley—The following officers were elected: W. H. Gibson, President; B. F. Type, Vice President; C. M. Anderson, Secretary-Treasurer; Z. M. Ab-shear, Delegate.

C. M. ANDERSON, Secretary.

Pendleton—The following members were elected officers for the ensuing year: T. C. Nichols, Morgan, President; W. A. McKinney, Falmouth, Secretary-Treasurer; O. W. Brown, Vice President and Ed Wilson, Delegate.

W. A. M'KINNEY, Secretary.

Russell—The following officers were elected at the regular meeting: J. B. Tartar, President; W. G. D. Flanagan, Vice President; J. B. Scholl, Secretary; L. D. Hammond, Delegate, J. B. Tartar, Alternate; L. D. Hammond, J. S. Rowe, W. G. D. Flanagan.

J. B. SCHOLL, Secretary.

Whitley—At the regular meeting of the Whitley County Medical Society the following officers were elected: J. O. Adkins, President; Garfield Howard, Vice President; C. A. Moss, Secretary-Treasurer; L. B. Croley, Delegate; C. A. Moss, Alternate.

C. A. MOSS, Secretary.

Whitley—At the regular meeting of the Whitley County Medical Society, the following officers were elected: J. O. Adkins, president; Garfield Howard, vice president; C. A. Moss, secretary-treasurer; L. B. Croley, delegate; C. A. Moss, alternate; L. B. Croley, W. J. Smith, censors

C. A. MOSS, Secretary.

Edema in Infants with Spasmophilia.—Bosser's research on the metabolism confirmed his clinical findings that children with severe spasmophilia but sound heart and kidneys are liable to respond with edema and sometimes with carpopedal spasm when fed with egg-flour gruel with no more salt than the percentage in breast milk. No edema develops when the children are getting a mixed diet at home. Nitrogen and minerals are retained, but when the egg is dropped and abundance of water given, they are eliminated.

Familial Trichinosis.—MacLachlan cites the histories of two brothers, a brother-in-law and his son who presented marked eosinophilia and *Trichina spiralis* in the muscle tissue examined. The wives of both men and son of one of them showed an eosinophilia of 8, 27 and 37 per cent., respectively. As they were all apparently well, and as according to their own statements they had never been sick, the removal of muscle was not possible. These ten people were well until very shortly after they had eaten pork, which later was proved to be infected by *Trichina spiralis*.

BOOK REVIEWS

The Practical Medicine Series—Comprising eight volumes on the year's progress in medicine and surgery. Under the general editorial charge of Charles L. Mix, A. M., M. D., professor of physical diagnosis in the Northwestern University Medical School. Volume 2. General Surgery. Edited by Albert J. Oschner, M. D., F. R. M. S., LL. D., F. A. C. S., Major, M. R. C., U. S. Army, Surgeon-in-Chief Augustana and St. Mary's Hospitals; Professor of Surgery in the Medical Department of the State University of Illinois. Series 1920.

The Year Book Publishers, 304 South Dearborn Street, Chicago. Price \$1.75.

The subject is placed before the surgical profession in as concise and usable a form as we can a review of what is contained in the year's surgical literature. There being less of war surgery and more of that which the active surgeon can use from day to day than was contained in the last volume.

Our foreign literature has not regained the proportion it occupied before the war.

Nothing has occurred of revolutionary importance, but much has been gained in observations and experience which will undoubtedly be of much value in the actual practice of men who are progressive in their surgical work. Local anesthesia seems to have gained considerably since the more treacherous remedies have been replaced by novocain and its various equivalents.

The Practical Medicine Series—Comprising eight volumes on the year's progress in medicine and surgery. Under the general editorial charge of Charles L. Mix, A. M., M. D., Professor of Physical Diagnosis in the Northwestern University Medical School. Volume 4. Pediatrics. Edited by Isaac A. Abt, M. D., associate Pediatrician Michael Reese Hospital. Orthopedic Surgery. Edited by Edwin W. Ryerson, M. D., Associate Professor of Surgery (Orthopedic) Rush Medical College; Professor of Orthopedic Surgery, Chicago Polyclinic; Attending Orthopedic Surgeon, Presbyterian and Children's Memorial Hospitals and the Home for Destitute Crippled Children. With the collaboration of Robert O. Ritter, M. D., Associate Attending Orthopedic Surgeon, Children's Memorial Hospital. Series 1920. The Year Book Publishers, 304 South Dearborn Street, Chicago. Price \$1.75.

These series are published primarily for the general practitioner, at the same time the arrangement in several volumes enables those interested in special subjects to buy only those parts they desire.

The American Red Cross in the Great War—

By Henry P. Davison, chairman of the War Council of the American Red Cross.

"The far-reaching and multifarious activities of the American Red Cross in the great war are described with a wealth of accurate detail in this book by the chairman of the organization's war council. The ramifications of the work of mercy were innumerable; they included everything from handing out hot coffee to American soldiers on their way to cantonments and ports of embarkation to administering relief in the typhus areas of Russia. And whatever the job to be done, the Red Cross accomplished it efficiently, courageously, humanely.

Illustrated. All the author's royalties on this book go to the Red Cross. The MacMillan Company, publishers, New York. Price \$2.00.

Laboratory Manual of the Technic of Basal Metabolic Rate Determinations By Walter M. Boothby, M. D., and Irene Sanford, Ph. D. Section on Clinical Metabolism. The Mayo Clinic, Rochester, Minnesota, and the Mayo Foundation, University of Minnesota. Octavo volume of 117 pages with 11 Tables and Charts of explanation. Philadelphia, and London: W. B. Saunders Company, 1920. Cloth, \$5.00 net.

New methods of precision for the study of disease are continuously passing from the purely scientific to the more practical clinical application. The most recent of these methods of precision and probably the most difficult technically is indirect calorimetry. This manual has been prepared in the effort to render this valuable diagnostic method available to any well-equipped and scientifically conducted clinical laboratory, and with the hope that the results of indirect calorimetry will not be thrown into general discredit by a neglect of the details requisite for obtaining a true basal metabolic rate.

The Story of the American Red Cross in Italy—By Charles M. Bakewell. Illustrated. The MacMillan Company, New York Publishers. Price \$2.00 net.

The American Red Cross responded instantly to the needs of Italy in her first distress. This book tells not only of the establishment of relief centers, workhouses, traveling canteens, "asili" for children and large hospitals, but also of the building of entire cities for the accommodation of refugees from the Piave and from Venice.

It is a great and inspiring record of one of the many activities of the American Red Cross, and it tells in a simple talk what the funds so generously contributed by American people accomplished in Italy.

Hygiene of Communicable Diseases, a handbook for Sanitarians, Medical Officers of the Army and Navy and General Practitioners—By

Francis M. Munson, M. D., Lieutenant, Medical Corps, U. S. N., Retired; Lecturer on Hygiene and Instructor in Military Surgery, School of Medicine, Georgetown University; Formerly Instructor in Medical Zoology, Georgetown College; Late Brigade Surgeon, and Provisional Brigade, U. S. Marines. Illustrated. Paul B. Hoeber, New York, publishers. Price \$5.50.

The aim of this manual is to present in a concise and readily accessible form the information now available concerning epidemiology and the management of the communicable diseases, ashore and afloat. With this end in view their various phases have been carefully separated so that the reader may quickly obtain the information sought on any particular point, under all conditions of civil, military, and naval life. The writer's experience as a medical officer and sanitarian in different parts of the world leads him to believe that such a presentation of the subjects of epidemiology, prophylaxis, and sanitation will save the time of the physician, sanitarian, sanitary engineer, missionary, or medical officer, and be of real practical value to him when he is confronted with the danger or is in the actual presence of any of the communicable diseases, whether in sporadic, endemic, or epidemic form. The sanitary measures and procedures indicated in various emergencies and under varying conditions are described in carefully headed sections, subsections and paragraphs in a manner that, it is hoped, will enhance the value of the book as a work of ready reference. New features are considered: sanitary measures following great disasters, for example, have not heretofore been discussed in a textbook. In Part II each disease is considered separately, and directions are given for its control. The general plan of this part of the work is that followed by the Committee on Standard Regulations of the American Public Health Association in their report entitled "The Control of Communicable Diseases," published as Reprint No. 436 from the Public Health Reports.

In the preparation of the book only the most trustworthy authors have been consulted and no statement is not supported by competent authority.

Practical Preventive Medicine—By Mark F. Boyd, M. D., C. P. H., Professor of Bacteriology and Preventive Medicine in the Medical Department of the University of Texas. Octavo volume of 352 pages with 135 illustrations. Philadelphia and London: W. B. Saunders Company, 1920. Cloth, \$4.00 net.

An endeavor is made to briefly present the salient features of modern preventive medicine. In a desire to cover the entire field, a great condensation has been effected, which in many instances perhaps results in an inadequate con-

sideration of important subjects. It is believed this represents the minimum knowledge of the subject which a student of medicine or a practitioner of medicine should be expected to possess.

While admittedly brief, the student or reader desiring a broader knowledge will be assisted by the numerous references given. These have been particularly designed to introduce the student to the vast stores of public health literature which exist in the publications of various departments of the United States government. Any individual especially interested in this field should make every effort to acquire those listed and keep in touch with the new publications issued.

The medical profession can play an important role in the field of preventive medicine and public health. At present physicians are neglecting their opportunities. If this neglect continues the opportunities will lessen and the field will be taken away from physicians by a changing public sentiment. If these pages will bring home to medical students and practitioners a realization of their public health responsibilities and stimulate co-operation with public health authorities, the labor of their preparation will have been abundantly rewarded.

No originality is claimed for the material here presented. All available sources of information have been freely utilized. Special acknowledgment should be made of the utilization of Rosenau's "Preventive Medicine and Hygiene" to which the specialist or advanced student will naturally turn, and to the report of the Committee on Standard Regulations of the American Public Health Association.

A Manual of Pathology—By Guthrie McConnell, M. D., Associate in Pathology Western Reserve University, Medical School, Cleveland, O. Fourth Edition. Thoroughly Revised. 12 mo volume of 611 pages, with 18 illustrations. Philadelphia and London: W. B. Saunders Company, 1920. Cloth, \$4.50 net.

The purpose of this volume is not that it shall attempt to take the place of the more voluminous text-books on pathology, but that it shall enable the student especially to rapidly acquire the salient points of a subject. To this end the author has sought brevity, but has tried at the same time not to sacrifice clearness in the exposition of the material.

"Not only disturbance of function and chemical disturbances are brought to mind, but even symptoms. Thus the subject is correlated to clinical medicine. This makes it the most interesting and altogether the most readable book on pathology available alike for the student or for the practitioner."

The Anatomy of the Nervous System, From the

Standpoint of Development and Function.—By Stephen W. Ranson, M. D., Ph. D., Professor of Anatomy in Northwestern University Medical School, Chicago. Octavo volume of 395 pages with 260 illustrations some of them in colors. Philadelphia and London: W. B. Saunders Company, 1920. Cloth, \$6.50 net.

Dr. Ranson presents his subject from the dynamic rather than the static point of view—that is, he lays emphasis on the development and functional significance of structure. The reader is led at the very beginning of his neurologic studies to think of the nervous system in terms of its relation to the rest of the living organisms. By this method structural details become interesting instead of dull, and the correlation of the various neurologic courses is made more easy. During the past twenty years many considerable additions have been made to the science of neurology. The more important of these have been included by Dr. Ranson. An outline for a laboratory course in neuro-anatomy has been included.

The Roentgen Diagnosis of Diseases of the Alimentary Canal.—By Russell D. Carman, M. D., Head of Section of Roentgenology in the Division of Medicine, Mayo Clinic and Professor of Roentgenology (Mayo Foundation) Graduate School of Medicine, University of Minnesota, Second Edition Thoroughly Revised. Octavo of 676 pages with 626 original illustrations. Philadelphia and London: W. B. Saunders Company, 1920. Cloth, \$8.50 net.

The new edition of this work is 100 pages larger than the first edition and contains 122 additional illustrations. Two new chapters appear, one on hour-glass stomach, and the other a chronological abstract of the published work on pneumoperitoneal diagnosis of abdominal lesions. So much new matter has been interpolated throughout the volume that it is really a new book. It represents a summing up of the work done at the Mayo Clinic in the use of the roentgen ray in the diagnosis of diseases of the alimentary canal.

A Text-Book of the Practice of Medicine.—By James M. Anders, M. D., Ph. D., LL. D., Professor of Medicine Graduate School of Medicine University of Pennsylvania, Fourteenth Edition. Thoroughly Revised with the assistance of John H. Musser, Jr., M. D., Associate in Medicine, University of Pennsylvania. Octavo of 1284 pages fully illustrated. Philadelphia and London: W. B. Saunders Company, 1920. Cloth, \$10.00 net.

In this revision special attention has been given to the practical phases of internal medicine, stressing those complaints which come most frequently under the notice of the general practitioner. The descriptions of many diseases have

been amplified, among them typhus fever, yellow fever, cerebro-spinal meningitis, pneumonia, ieterohemorrhagic spirochetosis, diabetes mellitus, scurvy, pellagra, pernicious anemia, exophthalmic goiter, focal tuberculosis, mumps, measles, hemolytic jaundice, hemolytic anemia of pregnancy and the puerperium, Banti's disease, asthma, and hay fever. Influenza has been rewritten entirely. In the section on diseases of the heart, certain diagnostic criteria for determining the presence or absence of true valvular disease have been presented, and the various types of heart block discussed. Among complaints not hitherto described in the work are bronchial spirochetosis, streptococcic (hemolytic) pneumonia, trench nephritis, disordered heart action, chronic (syphilitic) aortitis, intestinal emphysema, epidemic encephalitis, oxycephaly, wood (methyl) alcohol poisoning, and botulism.

The Endocrines.—By Samuel Wyllis Bandler, M. D., F. A. C. S., Professor of Gynecology in the New York Post-Graduate School and Hospital. Octavo of 486 pages. Philadelphia and London: W. B. Saunders Company, 1920. Cloth \$7.00 net.

Dr. Bandler's new book met with immediate success, the first printing having been entirely exhausted in one month. Undoubtedly this success is due to the fact that Dr. Bandler has written his book around first-hand—and pioneer—knowledge, having used glandular extracts in his practice before others would credit the value of such therapy. He covers the subject completely from its development to the application of the knowledge in diagnosis and treatment. The book appeals to the practitioner because it gives him the modern conception of endocrinology. It appeals to the diagnostician because it stresses the diagnosis of many conditions that are frequently wrongly attributed to some secondary cause. It appeals to the neurologist, the alienist, and the criminologist because it shows conclusively that the endocrines are directly responsible for many nervous conditions, for abnormalities of mind, and for criminal minds. It appeals to the gynecologist, because it is in the practice of gynecology that the greatest advances have been made in glandular therapy.

Annotated Subject, Index, and Order List of Books and Pamphlets.—Including Government Reports on Maternity and Child Welfare in England and Scotland. American Red Cross, National Headquarters, Washington, D. C., Publishers.

In conducting child welfare work abroad during the war the American Red Cross collected valuable data and it has been published in pamphlet form and those interested in this line of work can secure this volume free by writing to the above address.

Heart Affections, Their Recognition and Treatment.—By Calvin Smith, M. S., M. D. Instructor in Medicine, University of Pennsylvania Graduate School of Medicine, Physician to the Philadelphia General Hospital; Formerly Special Cardiovascular Examiner U. S. Army. Illustrated Military References with permission of the Surgeon-General. F. A. Davis Company, Publishers. Price \$5.50 net.

This is a treatise that deals with the heart and its affections—a book that does not presuppose a knowledge of the subject and that strives to encompass in small volume sufficient fundamentals of anatomy, physiology, pathology, diagnosis and treatment to give the busy physician a working knowledge of the more recent advances in studies of the heart.

Contact with medical men in civil life has taught men, says the author, the need of a fundamental volume on the heart, as have also requests of medical students. Physicians engaged in military work at American training camps and abroad have voiced a similar sentiment.

Massage and Exercises Combined—A permanent physical culture course for men, women and children. With 86 illustrations and deep breathing exercises. By Albrecht Jensen, Formerly in charge of Medical Massage Clinics at Polyclinic Hospital and other hospitals. New York, Published by its author. Box 73 G. P. O., New York City.

The combined massage exercises in this book will graduate themselves to the strength of each person, they are therefore equally beneficial to strong and weak, old and young. No apparatus nor gymnastic equipment is necessary and no expenditure save the time required which will vary mostly from ten to twenty-five minutes daily, according to the time, need and inclination of the individual.

Nitrous Oxide Oxygen Analgesia and Anesthesia in Normal Labor and Operative Obstetrics.—Edited by F. H. McMechan, M. D., Published by the National Anesthesia Research Society.

This monograph furnishes to obstetricians and anesthetists the best thought and opinions on this subject to date. The work is really a compilation; a digest of the very voluminous literature on the subject, from the methods first recommended by Bert in 1878, including the experience of Klinowitch and Winckle in 1880 which was followed by a long period of apparent abandonment, until the revival by Guedel, Davis and others about ten or twelve years ago.

The action of the gases, variations in the technique of administration, self-administration by the patient, etc., are fully described, and the appendix contains a large number of references to the literature of the subject.

This is the first publication sponsored by the National Anesthesia Research Society. The name of F. H. McMechan as editor guarantees the volume is attractive and we readily recommend it to anesthetists and obstetricians. It is in fact, a book that might well be added to any physician's library. Copies are \$2.50 from the N. A. R. S., T. T. Frankenburg, Sec'y., 16 E. Broad St., Columbus, O.

NEWS ITEMS AND COMMENTS

Mr. George E. Vincent, President of the Rockefeller Foundation, authorizes the following:

The discovery by Dr. Hideyo Noguchi, at the Rockefeller Institute for Medical Research, of a vaccine for yellow fever, introduces a new factor in yellow fever control through the possibility of making persons immune to yellow fever by vaccination.

Heretofore, work in yellow fever control has been entirely that of prevention of infection by controlling breeding places of the mosquito which carried the yellow fever germ.—The isolation of the yellow fever organism, however, has made it possible for Dr. Noguchi to develop a serum which it is believed will reduce the mortality from yellow fever and a vaccine which gives promise of protecting the non-immune against contracting the disease.

Already vaccination against yellow fever of people going to tropical countries is being made in New York. This work is being done at the Broad Street Hospital with vaccine furnished by the Rockefeller Institute.

The first shipment of vaccine for yellow fever from the Rockefeller Institute to tropical countries was made a year ago when three hundred bottles were sent to Mexico. Other shipments have been made since then, the latest on November 10th. All vaccine supplied to Mexico is sent to the Mexican Department of Health which arranges for its distribution.

The Central American Countries are so well convinced of the efficacy of Dr. Noguchi's vaccine that they are permitting travel without quarantine detention of those who have been successfully vaccinated.

The following articles have been accepted by the Council on Pharmacy and Chemistry for inclusion in New and Nonofficial Remedies:

Calco Chemical Co.: Cinchophen Tablets.

Hynson, Westcott & Dunning: Globules of Benzyl Benzoate.

Heyl Laboratories: Achriflavine; Proflavine.

Intra Products Co.: Calcium Cacodylate—IPC.

Winthrop Chemical Co.: Salophen.

Morgenstern & Co.: Salopher.

KENTUCKY MEDICAL JOURNAL

BEING THE JOURNAL OF THE KENTUCKY STATE MEDICAL ASSOCIATION

Published Under the Auspices of the Council

VOL. XIX. 

BOWLING GREEN, KY., APRIL, 1921

No. 4

EDITORIAL

OPPORTUNITIES FOR HEALTH OFFICERS AND OTHER PHYSICIANS

The Annual School for County and City Health Officers, which the General Assembly of Kentucky has so wisely provided, will be held this year May 30 to June 4, inclusive, at the School of Public Health of the University of Louisville and the State Board of Health at the corner of Sixth and Main streets, in Louisville. A very complete program is being worked out, and it is hoped that this year's conference of health officers will be much the best that has yet been held in Kentucky. The Legislature, very wisely, at the suggestion of many progressive health officers, provided that attendance upon this special course should be compulsory, and that the expenses of the health officers attending it should be paid by the fiscal court or city council which employs them.

After all, the efficient organization of the local boards of health is the matter of real importance to the people in the various counties and cities of Kentucky, and it is hoped that this week, devoted to the consideration of the people's health, will attract to Louisville not only all the health officers, but practically all of the County Judges in Kentucky who are made by law ex-officio members of the local boards of health.

During these same dates, the Medical Department of the University of Louisville announces its Annual Alumni Clinic Week. Last year this splendid, practical program offered at the City Hospital and the Medical School for this week, attracted 185 doctors who remained throughout the week, and more than 400 were present for the Annual banquet. A much larger number is expected this year.

The program provides medical clinics each morning, and surgical clinics each afternoon, with ward rounds and special lectures in other

subjects. The clinics, during this week, are free to all physicians who will attend them.

Beginning on June 6, the School of Medicine and Public Health of the University of Louisville will offer to physicians a six weeks' post graduate course in the latest developments in the special branches of medicine and public health. Attractive, practical courses are being arranged, and a number of applications are already on file for them. Special arrangements will be made for laboratory and other intensive practical subjects. This course will be arranged under the supervision of Dr. Henry Enos Tuley, Dean, Medical Department of the University of Louisville, and inquiries should be addressed to him.

Under the progressive leadership of the medical profession of Louisville, Kentucky, it is proposed to restore that city to its prestige as one of the greatest centers of medical education. In this effort, the Journal feels that it can assure the cooperation and hearty good wishes of all those interested in the future of medicine.

AUTOMOBILE CASUALTIES: A PUBLIC HEALTH PROBLEM

A recent editorial in one of the leading medical journals of the United States calls attention to the fact that automobile casualties are so frequent and serious that it becomes a public health problem. In the city of Birmingham, with a population of 178,000 people, the percentage of fatal accidents is 16.3 per cent per 100,000 population, and the death rate from typhoid is 12.5 per cent and from diphtheria 13.9 per cent. It therefore follows that more people are dying from avoidable automobile accidents than from either of the two diseases mentioned, that are considered among the most important public health problems.

It should be mentioned that the number of deaths from typhoid fever and diphtheria has

decreased tremendously in the past twenty years. This decrease has been due largely to the fact that the public has been educated regarding the causes of and the methods for preventing the accidental contraction of the preventable diseases. The number of deaths and accidents without mortality from automobile accidents seems to be increasing and it is high time that the public should be educated regarding the causes of and the methods for preventing automobile accidents.

If the persons who drive automobiles understood the danger to themselves and to others from reckless or careless driving, there would be fewer accidents. The educational propaganda for preventing typhoid fever, diphtheria and other communicable diseases has been carried on by the doctors with the cooperation of the public. The newspapers have performed a great service by giving the public the information that was needed to make them use the necessary precaution to prevent accidental diseases and the schools have been great disseminators of information for the protection of the public from various infections.

There are, of course, different angles to the problem of preventing automobile accidents than the other public question of decreasing disease; but the principle of educating all the people to the point where they will realize the danger to themselves and to others by taking unnecessary risks while driving automobiles is the same as teaching them to avoid exposing themselves and others to contagious diseases. The newspapers stand ready to aid in the campaign against automobile accidents as they have always done in the fight to prevent diseases. The schools may also be utilized to advantage in such an educational campaign. What the child learns he will impart to his parents, and it should be remembered that the children of today are the automobile drivers of tomorrow.

It is a business proposition with every man in the automobile industry to remove the condition that threatens to interfere with the use of automobiles both for pleasure and business.

In spite of all the educational campaigns to prevent automobile accidents, and even with honest effort on the part of the civil authorities to prevent speeding, there will always be fools who are allowed to drive automobiles. Therefore, the only safe method of driving a machine is for one to feel that he has no rights of the road, and that he must expect the other driver to go on the wrong side of the street or to cut corners while speeding. The only safe thing is to get out of the way of every other man driving a car, and

of every pedestrian who may be expected to get in front of an automobile when he should be on the sidewalk.

In addition to the above, the question of the lights used on the automobiles at night is as important as it is serious. It is serious, because many eyes are painfully affected from the brilliant searchlights that are used, thus causing not only pain and temporary blindness, but because of this accidents are liable to occur. Unfortunately, automobile courtesy is not observed as it should be on the public highways. When the signal is given by an approaching machine to dim their lights, too frequently this is not noticed, and one of two things will result; the man who is blinded and in pain must stop his machine or run the risk of going over an embankment. While this problem is being agitated and stringent laws enacted, if drivers of machines are not more considerate, side from the altruistic motive of the prevention of pain, death and temporary blindness from automobile accidents, the consideration of the use of searchlights at night is a matter of self-preservation, and steps should be taken to rigidly enforce the laws regarding our streets and roads being made safe for law-abiding citizens. Why should not a city spend as much for public health safety as it does for its fire department and police department? Considering the importance of physical development as a source of joy, profit and power, it is hard to see why the public does not see the importance of spending an equal amount for these blessings as they do for protecting their citizens in other ways.

J. A. S.

SCIENTIFIC EDITORIALS

THE NATIONAL ANESTHESIA RESEARCH SOCIETY

The National Anesthesia Research Society was organized about a year ago, and had its first meeting in Pittsburgh in October, 1920, in conjunction with the Interstate Association of Anesthetists, and the Pennsylvania State Medical. A brief outline of its object might be of interest.

We quote from the secretary: "The society was organized by forward-looking manufacturers of anesthetics and apparatus to provide a limited financial foundation for the following objects:

"1. To promote the science of anesthesia and to enable the members of the society, and others, to submit to the dental and medical pro-

fessions any views, finding or accomplishments they have attained.

"2. To obtain from all available sources information concerning any material, liquid or gas, known to have anesthetic properties.

"3. To arrange in cooperation with dental, medical and anesthesia associations, for the preparation and delivery of suitable interesting and educational papers on the general subject or relative to some particular anesthetic.

"4. To use its influence to avoid the publication or circulation of any false or unauthentic statements concerning the science or practice of anesthesia, or about any anesthetic.

"5. To receive and tabulate reports of any and all conditions, symptoms or phenomena prevailing during or after anesthesia by any anesthetic and to prepare and distribute, or request, forms on which such information can be tabulated with uniformity.

"6. To distribute by pamphlet or publication, as its funds may permit, such reliable data as may be collected or obtained from those interested in the subject.

"7. To aid, as far as possible, in the preparation, publication and sale of suitable text-books on the subject of anesthesia, and to prepare as rapidly as possible reference books for use by the medical and dental professions.

"8. To cooperate with the state authorities in the preparation of suitable legislation to safeguard those to whom an anesthetic is to be administered, as well as those called upon to administer it.

"9. To arrange for the production of moving picture films to illustrate to the profession the action of anesthetics on the patient during induction and maintenance of anesthesia, and to prepare articles for publication in magazines and the public press.

"10. To use its influence in every possible way and to give its aid toward the advancement of the science, practice and teaching of anesthesia."

We can add but little to the above, which is a comprehensive resume of the organization's aims and ideals.

The society is conducting a survey of hospitals, and medical schools to ascertain the status of anesthesia teaching. It is interesting to note here that at least two medical schools in the past year or so, have established full professorships in Anesthesia; the University of Maryland Medical Department in which the Chair of Anesthesia is filled by Dr. S. Griffiths Davis, and the Medical Depart-

ment of the University of Louisiana, the chair there being held by Dr. Ansel M. Caine.

The first publication of the N. A. R. S. is briefly reviewed in this issue. The function of an official organ for the activities of this society is filled by monthly bulletins sent to the members and containing a record of the miscellaneous activities, as well as at least one scientific contribution each month.

W. HAMILTON LONG.

BECKONING HANDS

In these days the thoughts and plans of public spirited citizens are being directed more and more towards the elimination of the causes of sickness, poverty, misfortune and death. The custom of searching out first causes is slowly but surely becoming a fixed habit, and intelligent efforts in this direction are seen and heard of more frequently every day.

In no activity is this more true than in public health work. The forces interested seek constantly to prevent the very beginnings of trouble—seek to prevent anyone from striking the match that would result in a conflagration. They endeavor to keep the first case of diphtheria, or typhoid, or measles from developing. And they endeavor to reach ahead of time those identical spots where trouble is most likely to start. The reason they do not reach all the threatening spots is because they are held back by forces which they cannot control and by obstacles which they cannot always overcome.

Great intelligence is always manifested by the people of a county or a neighborhood who work together in an effort to eliminate the obstacles that stand in the way of the progress of public health work.

The danger spots in this state lie at the heads of the two hollows and in other out-of-the-way places where the hands of the health forces do not reach very effectively.

Nobody's health is entirely safe until everybody's health is adequately cared for.

It matters not how poor the family may be, how high upon hillside or mountain side, or how far back in swamp the people may live, it matters not whether they be white or colored, the fact remains that the unreached family or the unreached child is a perpetual menace to the health of every person in the neighborhood. We cannot escape the possibilities of trouble so long as there is one person in the neighborhood not properly cared for.

In thousands of homes in Kentucky there are people who are constant sources of danger to the general health of the people about them. They are not properly instructed—

—can't be until hundreds of other health workers are added to the present forces, and until our schools enter this fight to save life and health. They cannot receive adequate attention because there are no hospitals within their reach, they do not receive even the reasonable care, for doctors do not always reach them promptly when they are sick—and not at all before they become sick. The doctors cannot reach some of them promptly because the roads at this season in thousands of places are almost impassible. Defects are not discovered in incipient stages in children because no provision is made for medical examinations. The majority of teachers cannot make even the simplest preliminary examinations, and very few attempt to make any at all. They have had no training in that particular thing. They may have had courses in the science of the mind, but very few have ever had a course that would teach them how to examine the teeth, eyes, throat of a child who habitually fails in his school work.

Up near the heads of the hollows—away up above the spot where the road forks the last time—there are thousands of people living in Kentucky today who suffer all the ills of the perpetually neglected simply because the steps have never been taken to reach them. And they are not all in the hollows, but they may be found in every part of the state from the Tug river to the Mississippi. They get sick, pass their illness on to the neighbors who call to see them, suffer and often die without proper medical care—die by the hundreds because proper medical care is not within their reach, and their means. Poverty, bad roads, distance, the absence of hospitals, the lack of public health workers, the scarcity of doctors, cannot be overcome, so they suffer and die.

Do these neglected people actually exist in numbers sufficiently large to interest the other people of the state? Do they exist elsewhere in the Southland?

I recently put into the hands of a class of about 40 young men and women a questionnaire calling for information about neglected people in their neighborhoods. The reports that came in are rather convincing. Several states were represented in the group, Kentucky having the largest number of representatives.

Extracts from some of these reports follow:

1. From a Virginia girl: "There are people in my county out of reach of medical attention. The nearest doctor is about 17 miles away. There is no public health nurse in the neighborhood. I know a family of seven, five of whom had typhoid. On account of bad

roads and lack of money they could not get a doctor. He wouldn't ride on horseback, and he couldn't get his car to the place, so he wouldn't go.

"I really think this one community uses as much patent medicine as any other five. Last summer I helped to put up rural mail, and every day we sent out dozens of boxes of pills."

This young lady suggests that the county employ doctors to visit homes located in the hollows and on the mountains where because of bad roads and scarcity of money "other doctors won't go."

2. From a Kentucky boy: "There is a certain remote section near my home out of reach of proper medical attention. The roads are very bad most of the year, and the nearest doctor is seven miles away. He has to ride horseback everywhere he goes, and he has such a large territory to cover that many times the patient has to suffer for three or four days before he can get there. Once a boy with a broken leg suffered for two days before the doctor could get to him. In a case of childbirth the young mother died because the doctor could not reach her in time."

3. From another Kentucky boy: "In a particular neighborhood in this state there are places out of reach of proper medical attention. The nearest doctor lives twenty miles away from some of the homes. A certain baby in this neighborhood had diphtheria and before the doctor could reach the home the child died. A man broke his arm and cut an artery. The doctor was so far away that the man died shortly after the doctor arrived."

4. From a Kentucky girl: "A woman I know was out of reach of medical attention, and was expecting to be come a mother. One night when her husband was away after a doctor the baby was born, and for months afterward the mother lingered near death."

5. Another Kentucky girl tells this incident: "There was a boy who had his arm crushed in an accident, and because he was absent ten miles from a doctor he didn't call one until it was too late. Blood poison developed and his arm had to be removed."

6. This also from a Kentucky girl: "Yes, I know of people who have suffered because of a lack of medical attention. One child I knew was sick, and was very bad off." The parents said it only had a cold and croup. They gave it red pepper tea and all sorts of patent cures. The mothers of the neighborhood would take their babies in the house to see the sick child, and it wouldn't be long until their children would be in the same condition. In a few days the first child was

buried; then the next sick was buried, and it kept on till five under eight years of age had died.

"An older sister of one of the little girls came home, called a doctor at once, and it was discovered that the trouble was diphtheria. The doctor was five miles away, and there were very bad roads to go over. Three of the families were too poor to call a doctor."

Then she adds this comment: "If they had not been so poor he would not have gone anyway, for he makes it a practice to go only into society homes."

But it is needless to multiply examples. Most of the other papers not quoted are filled with reports of people who became sick, suffered and died without proper medical care.

The reasons given again and again are:

1. Bad roads.
2. No public health nurses.
3. Distance.
4. Scarcity of doctors.
5. Too poor to pay the price.

Every nurse in Kentucky who visits country homes knows of many families just like these referred to. Many of us who are not nurses know plenty of them. Every legislator ought to know of such cases, and ought to take steps to provide for the attention and care which they need.

Here are the specific things which compel thousands of people in this Commonwealth to go without proper medical care:

1. Bad roads. Some people always live in remote places. Until a system of road-building is adopted that will insure good roads to the heads of the hollows we shall continue to bury children and older people who die because rocks, ruts and mudholes stand between them and life. Some must pay for bad roads with broken harness, higher prices, worn out teams; others must pay with life,—and the majority of the latter are helpless children who did not choose their places to be born in.

2. The absence of district hospitals. Thousands of children with adenoids, diseased tonsils, other physical defects will grow up into mere fractions of men and women because provisions have not been made for taking care of their bodies properly. An army of Kentucky people die every year of tuberculosis because these district sanatoria have not been built. We cannot hope to do away with this tremendous loss of human life until we set about building sanatoria and good roads in places where they are most needed.

3. The absence of public health workers. We shall find it exceedingly difficult to do away with poverty as long as children con-

time to be born with only a fraction of their strength to begin life with, but we can do away with many ills that follow in poverty's wake. We shall take a long step in this direction when we provide nurses and other highly trained medical officials whose duty it will be to seek out the families in need and bring them the relief they are too poor to pay for.

4. Lack of information about the causes and prevention of common diseases. Every school in Kentucky, from the smallest and most rural school to the State University, has at this time a wonderful opportunity to give very practical instruction in health and sanitation to every student who enters its doors. No student ought to remain for any reasonable time in any school without hearing talks or lectures on personal and community hygiene by some one who knows. And no student should ever be permitted to go out of any normal school in the state with a certificate which does not show that he has had training that will enable him to make preliminary examinations for physical ills, and teach the practical things about the prevention of diseases. Accredited representatives of the State Board of Health should determine whether or not the training measures up to the required standard.

5. The scarcity of doctors. I fear that this difficulty will never be removed until the state sees to it that roads are built that do not keep a doctor's life in jeopardy on a dark night, and that district sanatoria are built to furnish facilities for surgical work and for the protection of patients from their well-meaning friends who crowd into the sick room. It is equally desirable that public health nurses be provided for all remote places so the doctor will have someone besides the granny-doctor to leave in charge of patients when he must be away on other calls.

6. And the last I mention, but it is by no means the least important, is the lack of knowledge of proper foods for infants and sick people.

Nothing else can ever take the place of such knowledge. All over this state children suffer and die by hundreds and hundreds every year because of improper feeding. We may expect this death harvest of infants until every mother and every girl who is ever likely to become a mother is carefully taught the very specific things which are suitable for a child's food and those which are not. So long as mothers insist that anything the family has on the table is good enough for infant stomachs, that coffee, fried meat and fried eggs, half-ripe peaches and green corn, sauer kraut and everything else the

mother eats should be shared with the child, we may expect this toll of child life to continue.

And many mothers will keep on believing this until every school and woman's club, and Sunday school, and church, and every other organization joins in a movement to see that the right information with the reasons why reach every mother and every mother's daughter even in the remotest homes. The work will be but half accomplished even if a few remain unreached. They will serve as carriers of the wrong kind of information that will multiply itself rapidly as soon as constructive efforts to spread the right knowledge cease. And the legislators of the state can best manifest their interest by making the necessary appropriations and passing other measures suggested by the people who know what health laws are needed and what health work ought to be.

Not a school will be doing its full duty, nor will Red Cross, nor Sunday schools, nor churches, nor women's clubs, nor other agencies until every child and every child's mother is adequately reached.

And not a legislator nor a citizen will be doing his full duty until the knowledge and the will is implanted in every father to provide the kind of food the children most need, and the determination is born to make the care of his children the major interest of his life.

Nobody's child is entirely safe until everybody's child is properly cared for.

The acid test of the civilization of a people is whether or not that civilization gives proper care to the less fortunate element among them. If there are no unreached people in marginal places, the civilization is worthy and real; but if unreached people abound, the civilization and the system of education are to that extent a failure.

How long will it be before we reach in an adequate manner these thousands of people, mostly poor people, who dwell at the heads of the hollows?

Only the state legislators and the citizens of this Commonwealth can answer that question.

JOHN F. SMITH,

Professor of Social Science Berea College Academy.

Relations Between Creatinuria and Acidosis in Diabetes—M. Lauritzen determined the creatin content of urine in a number of cases and found the continued presence of this substance a prognostically bad sign.

ORIGINAL ARTICLES.

PROSTATECTOMY*

By J. HUNTER PEAK, Louisville.

While the scope of this dissertation is limited by superscription to the discussion of technical details in connection with prostatectomy, a preliminary anatomico-pathologic survey seems requisite to a thorough understanding of the subject. Etiology, symptomatology and diagnosis of prostatic disease will be mentioned only incidentally as the occasion may arise.

Anatomically the normal prostate is a trilobed sexual gland derived from the Wolffian body, situated within the male pelvis posterior to the deep perineal fascia between the symphysis pubis and rectum. It surrounds the so-called "prostatic" urethra, extends upward to the vesical neck, and backward to the rectal wall to which it is attached.

In size and conformation the organ is normally subject to considerable variation, but may be approximately described as pyriform in shape measuring one and a half inches transversely, one inch antero-posteriorly and three-fourths inch in depth. The base is directed proximately toward the urocyct, the apex distally toward the penile appendage. It consists of two equal-sized lateral lobes and a smaller mid-lobe, the latter being merely a triangular isthmus or eminence situated between the lateral lobes and is sometimes nonexistent. The position of the prostate is maintained by the pubo-prostatic ligaments, the posterior layer of deep perineal fascia, and the anterior portion of the levator ani muscle. The organ is completely invested by a capsule of fibro-connective tissue continuous with the recto-vesical fascia and the posterior layer of the triangular pubic ligament. Its substance is composed chiefly of unstriated muscle fibers and numerous small racemose glands opening into canals which join to form the excretory ducts which in number are variously estimated at from twelve to fifty.

The prostate blood supply is derived from branches of vesical, hemorrhoidal and pudic arteries. The veins form a plexus communicating with the pudendal plexus, the vesical plexus and finally discharge into the internal iliac veins. The nerves are derived from the hypogastric plexus of the sympathetic, and in their distribution are associated with ganglion cells; Pacinian corpuscles also occur on some of the nerves. In this connection, it may be interesting to note that, contrary to

*Read before the Kentucky State Medical Association.

the belief hitherto existing, the function of the normal prostate is not to control the urinary outflow, "but to furnish its secretion in jets at the moment of ejaculation in such a way as to mix it with the sperm in the urethra."

Pathologically prostatic lesions may vary from benign hypertrophies of uncertain or unknown origin to malignant neoplastic formations. "Our ideas are still quite hazy as to the reasons for the enlargement of the prostate which is so frequent in men over sixty years of age." The experimental and clinical observation that progressive diminution in prostatic hypertrophy sometimes occurred following castration or bilateral subcutaneous section of the spermatic cord, induced the belief that such enlargements were merely "swellings" and not true neoplasms—a theory which is now known to be erroneous.

According to MacCallum, in the majority of instances prostatic enlargement is due to the development of more or less distinct nodules of granular, opaque, and spongy appearance, embedded in the gland substance which itself may be much compressed by their presence; that they are surrounded by the dense stroma with some muscle, but, on the whole, the muscle seems atrophied rather than increased. "Taken together these nodules may often be 'shelled out' in one large, irregular mass, leaving the remnants of the old prostate tissue."

I believe the majority of observers have hitherto been too prone to regard prostatic disease as occurring only in elderly subjects, ignoring the fact that individuals much younger may be similarly afflicted. It is true, however, that prostatic neoplasms are more frequently encountered in the aged than the young. Simple hypertrophy is usually benign in character (adenofibroma,) whereas prostatic lesions in the young almost invariably owe their origin to acute infection or primary malignancy. Secondary malignant involvement of the prostate, either from extension by structural contiguity or metastasis, must be exceedingly rare. Both primary carcinoma and sarcoma have been noted, the latter being more frequent than the former, which is in contradistinction to malignant disease implicating glandular tissue in other anatomic situations.

Although about fifty per cent of prostatitis give the history of previous Neisserian disease, in my opinion this represents a negligible factor in the etiology of prostatic hypertrophy. Let it be emphasized that the determining cause of prostatic enlargement when not due to malignant disease for the most part remains uncertain or unknown.

It is a well established clinical fact that prostatic neoplasms may develop slowly and for several years induce no characteristic symptoms excepting slight dysuria and pollakiuria, then sudden urochesis may supervene. The patient discovers that immediate temporary relief may be afforded by catheterization, and in consequence he becomes a catheter habitue. The so-called "catheter habit" may continue for months or even years, but ultimately further catheterization becomes impossible, because of unequal enlargement of the prostatic lobes and urethral tortuosity thereby produced. After the patient or his physician has repeatedly attempted to introduce a catheter without success, the surgeon usually discovers that considerable traumatic damage has been inflicted upon the urethral interior and not infrequently a false passage to the urocyst has been created. This constitutes a serious complication because of the greater likelihood of infection. In the event infection of the urologic tract has already occurred, the false passage enhances clinical danger and renders the prognosis more uncertain.

The most prominent clinical manifestations of prostatic hypertrophy from any cause are: urocystic, urethral and perineal discomfort, dysuria, pollakiuria, and finally urochesis. Infection of the urocystic interior is followed by hypertrophy of its walls and consequent reduction in capacity with progressively increasing dysuria, pain and pollakiuria. Residual urine is an invariable concomitant and urochesis may be replaced by constant "dribbling." The patient usually presents a pitiable aspect when the invocation of surgery is sought.

Prostatectomy is indicated when from any cause the gland becomes sufficiently enlarged to markedly interfere with micturition and endanger the life of the individual from urocystic infection and renal implication which almost invariably sooner or later supervene. The only exception to this rule is where prostatic enlargement is due to acute infection which usually subsides under appropriate medical treatment.

There are two methods of surgical approach to the prostate, both of which have definite indications, viz, (a) suprapubic, and (b) perineal. The operative technique of prostatectomy has never seemed to me so complex and difficult of execution as certain authors would have us believe. Other things being equal the suprapubic operation is most suitable for patients who are thin, and the perineal approach is better adapted for those who are fleshy or have thick pendulous abdominal walls. Some surgeons unwisely employ one

method to the exclusion of the other. Of course, where a two-stage operation is necessary, the suprapubic route must always be selected.

While many surgeons advocate the two-stage operation in all instances, in my opinion this procedure should be limited to cases where there have been repeated attacks of uroschesis, or where in consequence of long continued residual urine and urocystic infection renal involvement has become so extensive that the patient's life is endangered, and where prolonged operation and protracted anesthesia would cause a high mortality. In the presence of crippled kidneys, urocystic infection and urethral tortuosity preventing catheterization, preliminary supra-pubic cystotomy should be performed for drainage. After restoration of normal renal function and subsidence of urocystic infection, the supra-pubic wound may be enlarged and the second stage of the operation completed. Where a catheter can be introduced and retained, I believe as good results may be secured by this method as by preliminary supra-pubic drainage without danger to the patient. Therefore, it becomes obvious that the two-stage operation is unnecessary where the patient can be successfully catheterized.

In this connection, I wish to emphasize the importance of "team work" which is now recognized as an essential factor contributing to the success of nearly every human undertaking; people have been made to realize and appreciate the fact that the best results are to be attained only by the combined efforts of all, each working in his respective field of endeavor.

In the medical profession "team work" has but one object in view, i.e., the ultimate recovery and restoration to health of the ill and afflicted. In prostatic cases the internist, the urologist and microscopist and the surgeon must work together. The urologist and laboratory workers conduct the urinary tests chemical, quantitative and eliminative—and offer their suggestions; then under the proper dietetic, reconstructive and eliminative treatment administered by the internist the physical status of the patient improves and he is soon ready for operation; the surgeon then finds that the most tedious and perplexing part of the work has already been completed, and applying the proper operative technique the prostate is enucleated.

The suprapubic method: In preparing the patient for suprapubic prostatectomy equal care should be exercised as for any other abdominal operation. The operative area must be shaven and cleansed the day before, and tincture of iodine again applied at the

time of operation. The gastro-enteric functions should have been normal for several days, and the rectum must be thoroughly emptied the morning of the operation by low enemata of saline solution. The urocystic cavity should be cleansed by frequent saline irrigations during several days prior to operation.

In emergency cases where there is inordinate urocystic distension because of pre-existing uroschesis, the viscus must be immediately opened. A median incision is made through skin, subcuticular fat, fascia and muscle; when the space of Retzius is reached it will sometimes be noted that the peritoneum extends downward over the anterior aspect of the urocyt this must be pushed upward to avoid opening the peritoneal cavity. The urocystic wall should be incised as high as possible for two reasons: (a) after emptying the viscus of its contents subsequent contraction leaves the opening in the most favorable plane for tubal drainage, and (b) by high incision the plexus of veins about the vesical neck is avoided, which is an important item in preventing hemorrhage. Where the catheter can be introduced the urocystic cavity is moderately distended with saline solution before beginning the operation. In emergency cases the two-stage operation may be required, and this must be determined as soon as the extent of the urocystic pathology is ascertained by inspection and palpation. However, if the physical status of the patient will safely permit, and the existing pathology be not too extensive, immediate completion of the operation is advisable. After cleansing the incised viscus of debris and arresting hemorrhage, the prostate is enucleated.

Should urethrostenosis exist as the result of traumatism or previous Neisserian infection, it can be quickly overcome by incision with the Otis urethrotome. Urethral tortuosity from unequal enlargement of the prostatic lobes does not prevent introduction of a steel sound, with the finger in the urocystic cavity as a guide. When properly manipulated the sound is a most valuable aid to the surgeon during prostatic enucleation. By having the assistant depress the penile end of the sound between the patient's thighs using the perineum as a fulcrum, the prostate is brought forward against the pubic arch. The sound also acts as a guide in protecting the urethra from injury, and as a means of steadying the prostate during enucleation; and if urethrotomy has been necessary the pressure of the sound controls hemorrhage.

The prostate may be best enucleated by employing long-handled scissors curved on

the flat. Guided by the left index finger the capsule is incised over each lateral lobe; with the same index finger the left and the right lobe is separated from its capsular bed and removed; the middle lobe can be easily enucleated through either the capsular opening. Any hemorrhage which occurs during this portion of the operation requires no especial attention, but must be controlled later. I have no confidence in nor do I employ the method of introducing rubber bags into the prostatic capsule to control hemorrhage; too much time is required in properly suturing the capsule; and besides it is an exceedingly difficult procedure. The quickest and safest method is to insert a large Nelaton catheter and pack around it in the capsular cavity a long strip of gauze the end protruding from the suprapubic incision so it may be later removed. After completing enucleation the sound is withdrawn and retention catheter introduced.

In closing the urocytic and abdominal walls the regular tier suture method is advisable using twenty-day catgut. Room should be left for insertion of a rubber drainage tube five-eighths of an inch in diameter fenestrated near the lower extremity so drainage will continue should the end become occluded by blood clot or pressure against the urocytic wall. The last suture above the tube and the only one below it should be applied as follows: These sutures must be sufficiently long for one end to pass through the urocytic wall on the left, and the other through the right side; insert the left-to-right and the right-to-left sutures through the muscle, then through the fascia, fat and skin, so that when tied on either side of the drainage tube the abdominal wall will be so closed that urinary extravasation, should the tubal lumen become occluded, will not enter the abdominal tissues but emerge around the tube. The dressing is composed of gauze applied above and below the drainage tube held in place by adhesive plaster.

An important feature in the technique is the manner in which the suprapubic drainage tube is held in position: Take a two-inch adhesive strip fourteen inches long and divide it in the middle one-half its length; then divide each half in the middle, thus making dressing so the two outside strips extend beyond the tube, and the two middle ones over four strips of one end. Apply this over the the wound and around the tube, one to the left and the other to the right side. The advantage of this method of application is that any traction thereafter exerted on the tube does not "pull" on the patient but on the

dressing. The ordinary retention catheter may be fastened in a similar manner.

Before the patient awakens from the anesthetic, normal saline irrigation should be started to demonstrate the patency of both catheter and drainage tube.

The patient is then placed in bed and continuous irrigation used for a few hours, until the water returns clear; irrigation is then practiced every three or four hours for three days, when the gauze packing may be removed; then two or three times daily for a week to keep the urocytic cavity clean; the tubes may then be removed.

The after-treatment resolves itself into simple care of the patient, watching the drainage while the tube is allowed to remain in position, and keeping the patient as dry as possible after it is removed. The suprapubic wound usually closes within ten to forty days after the drainage tube has been discarded. The patient may be then considered well, and is able to micturate in the normal way.

The perineal method: The perineal approach to the prostate differs in no essential respect from other perineal operations. However, I much prefer the half-moon skin flap method, i.e., beginning the skin incision over the left ischial tuberosity, thence extending it upward in a circular course to the posterior portion of the scrotal attachment, thence downward over the right ischial tuberosity. This skin flap is dissected backward nearly to the anal verge; a central incision is then made through the underlying tissues to expose the membranous urethra, which may be easily recognized by palpation over the urethral sound previously introduced after incising the urethral tissues, a guy suture is inserted in either side; and as the sound is then withdrawn Young's retractor is introduced through the opening in the membranous urethra.

The prostate is brought into the operative field by the assistant making downward traction. The surgeon then opens the capsule on the first side and then the other, enucleating the respective lobes with the finger or blunt scissors; after the lateral lobes have been removed, the middle lobe can be readily enucleated by pushing it in the opening of the left capsule. Of course, the ideal operation is to not open the urocytic cavity; but it is sometimes impossible to avoid this, and if such an opening be made it should be closed by immediate suture provided it can be accomplished with safety to the patient. After introducing a retention catheter the prostatic capsule is packed with gauze which is allowed to protrude through a central opening in the

skin flap. The incision in the membranous urethra is then closed and the moon-shaped skin flap carefully sutured in position. The urocytic cavity is kept clean by repeated saline irrigations through the retention catheter. In the event the vesical wall is so extensively damaged that immediate suture is impossible, a drainage tube may be inserted and gauze packed around it to control hemorrhage; and when such a tube is used continuous irrigation may be practiced as in the suprapubic method. Where a perineal tube is unnecessary the retention catheter is allowed to remain in situ until the perineal wound has closed. Healing rapidly progresses after the third day when the gauze has been removed from the capsule. A urinary fistula sometimes persists for a short time and then closes spontaneously, after which micturition becomes normal.

The after-treatment is quite similar to that applicable to the suprapubic method, i. e., simply general care and especial attention to the comfort of the patient by keeping him as dry as possible.

During my surgical experience I have performed probably five hundred suprapubic and three hundred perineal prostatectomies with only four fatalities and these followed the suprapubic operation. The first fatality occurred in a patient aged eighty-four years who never rallied from the effects of the anesthetic, and died the same afternoon evidently from the anesthetic and the shock. The second patient was practically well as far as the prostatic operation was concerned and was about ready to leave the hospital, when pneumonia developed and he died at the end of the fourth week. The third patient was eighteen years of age and had a rapidly growing fibro-sarcoma of the prostate which was easily removed. Death occurred eight weeks after the operation from extension of the malignant process. The fourth was just recently operated on and he died on the fifth day from the exhaustion. He was seventy-four years old and very feeble and would not permit the catheter to remain in position. It is my opinion now that he should have had the two-stage operation.

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DISCUSSION:

Irvin Abell, Louisville: There are one or two points about which I wish to speak, one of which

with reference to malignancy of the prostate, was brought out by Dr. Wheeler. If I understood him correctly, he stated that primary carcinoma or sarcoma of the prostate can be recognized by physical examination and cystoscopic examination. While this is true, they can be recognized by such means only when in an advanced stage. Consequently, if by such examination one may recognize that malignancy of the prostate is present, I am in thorough accord with Dr. Wheeler that no operative measure looking to its removal should be undertaken. However, there are types of malignancy of the prostate which in their earliest stage are not capable of recognition by these methods of examination, and this is particularly true of the carcinomata which are superimposed upon the adenomatous growth—so commonly observed in persons of advanced age. There is no clinical examination which will permit us to recognize this condition in the earlier stages, and often after the gland is removed visual examination does not enable one to distinguish it from the simpler type of growth, the microscope being required for its detection. In this type of cases, we may confidently expect cure.

The second point which I wish to discuss is the cases reported by Dr. Wheeler as having given rise to trouble after an operation, apparently successful, for prostatic obstruction. I take it that we are all agreed that in the operations for the removal of prostatic hypertrophy causing obstruction, the glandular enlargement is nucleated from within the capsule. This means that the entire gland is not removed; consequently, there is material left behind which may subsequently give rise to further growth. I have met with such cases as Dr. Wheeler has described, and in routine examination of the specimens removed, the microscope has shown invariably a large amount of fibrous material, as well as invariably prostatic follicular tissue. I recall one patient in whom the large portion of the prostate at time of removal weighed nearly six ounces. This patient returned within three years with sufficient reproduction of adenomatous tissue to necessitate re-operation. Another patient returned five years after operation with a large mass of prostatic tissue, denomatous in type.

We must bear in mind that while in the vast majority of cases, the relief of the prostatic obstruction will be followed by the most gratifying results there will nevertheless remain a small number of patients in whom the results will be disappointed to both patient and operator.

Owsley Grant, Louisville: The return of the growth, if such it be, in the cases reported by Dr. Wheeler is explicable in several ways, and is not really an infrequent occurrence. These growths noted by Dr. Wheeler after prostatee-

tomy had been performed, may have been either recurrences or may have been portions of the prostate that were not removed and that have hypertrophied since the operation. The most important feature of a prostatectomy, next to the assuagement of the patient's symptoms, is the complete removal of all hypertrophied tissue. The division of the prostate into lobes has been shown thoroughly to be an embryonic division and not all these lobes involved in the hypertrophy in each case. One portion, the anterior lobe is frequently difficult to reach, especially by the perineal route, and I have several times seen the results of this lobe having been incompletely peeled out and as a consequence interference with the act of voiding by the ball valve action which necessitated fulguration to remove the growth. One other set of glands exists which is not always hypertrophied, nor are they easily removed when they are, namely the subtrigonal or glands of Albarran. These left in situ may serve as the nucleus of future hypertrophy.

With reference to the choice of operation I believe that there are no practical nor theoretical advantages which outweigh the fact that the operator should be familiar with one form of operation, and that the skill that he will acquire from the performance or many of these in a routine way is the chief determining factor in the mortality rate in the hands of the expert. The consensus of both American and European opinion is beyond a doubt in favor of the suprapubic route, as it offers the easiest and simplest way to reach most prostates. The plan of doing the operation in two stages is fraught with many advantages. When we operate on an enlarged prostate we are operating on the kidneys as well, and it is the condition of the renal organs which is the criterion of the time and advisability of operating. The preliminary operation permits much better vesical drainage than can be achieved by the catheter, either by intermittent catheterization or the indwelling; the congestion of the prostate is much relieved and the gland shrinks very appreciably in size; the hemorrhage at the time of a secondary enucleation is much less than that at a primary; a path for drainage is well effected and the danger of the infection of the space of Retzius eliminated. I should like to add likewise my approval of the use of the Hagner bag and the Hamer cage as the most efficient method of controlling hemorrhage in the majority of cases.

Carl Wheeler, Lexington: With reference to carcinoma being superimposed upon adenoma of the prostate, I have gone over the statistics very carefully, and I still contend that a percentage of those cases should have shown some suspicious element.

Regarding suprapubic and perineal prostatectomy, the suprapubic route is the one that is

followed by the vast majority of surgeons the world over. Dr. Young, of Baltimore, is probably the only man left who favors perineal prostatectomy. Even Dr. Wishard, of Indianapolis, with a record of 500 perineal prostatectomies, performed his last 100 prostatectomies by the suprapubic route, and I believe if he were here today and compared his end results they would be vastly in favor of the suprapubic route.

The Hagner bag will control hemorrhage very efficiently. Dr. Grant mentioned Dr. Cabot in connection with the use of gauze packing. I was with Dr. Cabot one winter and he did not mention it.

Owsley Grant: He folded gauze in one layer, and with a string attached to the gauze brought it out through the urethra.

C. L. Wheeler: It is the same thing as the Hagner bag. Dr. Hagner did not devise this bag. It is a modification of the old Barnes' obstetric bag. Emmons Briggs first suggested the bag, and Hagner took it up. Dr. Paul Pilcher devised another bag which I have here. He leaves a channel for drainage below through a soft urethral catheter. It is absolutely absurd to say that no catheter will drain the bladder within the first few hours after a prostatectomy because invariably it will do it. I like this bag (illustrating) better than the Hagner bag. It catches the vesical neck, invaginates it, pulls it down into the capsule and prevents bleeding. While working with Dr. Cabot I found he had a hard time in anchoring the bag. He had a device gotten up by my friend Dr. Townsend, of Rutland, Vermont. I told Dr. Cabot that on my return to Lexington I would get a contraption to hold this, and this contrivance I show you now. This bag is pulled down through the urethra and the vesical sphincter is caught at the point I show you and is invaginated. Bleeding cannot take place. This contrivance holds the bag in place so that it cannot slip.

Number of Red Blood Corpuscles at Different Ages and Under Different Conditions.—H. I. Bing fixes the averages at 5.5 millions in men 6.1 millions in men below 30, slightly lower in and 5 millions in women. The upper limit is women. Above 60 the numbers are nearly normal in both sexes, some cases showing figures even higher than normal. This may be due to deficient cardiac power, but alcoholism also accounts for it. Of greater importance is the fact that the number of erythrocytes varies in different parts of the blood vessels and can vary greatly in the different capillaries. The physiologic condition of the extremities thus must be taken into account in clinical counts.

EXTENSIVE EPITHELIOMA OF THE FACE; TREATMENT OF BASAL EPITHELIOMA.*

By WILLIAM J. YOUNG, Louisville.

We are frequently confronted with neglected cases of epitheliomata of long standing which show the ravages and deformities resulting because the disease has been allowed to pursue its course undisturbed over a period of years. In extensive lesions of long duration the neoplasms are usually of the basal cell type, and such cases are amenable to radio-therapy. Much can be accomplished by massive doses of radium or the roentgen-ray.

Epitheliomata of the face are not always

using the massive dose with which we strive to effect a cure in one radiation, there is little likelihood of stimulating growth of the neoplasm, as is often the case when fractional doses are employed, and the cosmetic result



Case I.—Before treatment.

productive of severe pain, but are a constant source of annoyance to the patient both as regards the discharge and their unsightliness. A large percentage of them respond promptly to radium or roentgen-ray treatment given in massive dosage, and frequently one massive dose of either agent will cause the lesion to resolve to such an extent that we have a seeming cure. Where the patients (as is usually the case) are over sixty years of age, it is sometimes possible to produce relief from the constant worry and embarrassment, which such conditions always cause, for the remainder of their natural lives.

I believe all cases of epithelioma of the face involving extensive areas and of long duration should be given massive doses of radiation to see what may be accomplished. By



Case I.—After treatment

is certainly more sightly than following plastic surgery.

I am presenting two cases for your inspection:



Case II.—Extensive epithelioma of face, before treatment.

The first to demonstrate what may be accomplished by one massive dose of radium; the second to show how extensive this type of epithelioma may become without metastasis

*Read before the Jefferson County Medical Society.

and without symptoms beyond occasional itching and bleeding on slight manipulation. The second patient has been treated with the roentgen-ray, from what I can gather, with fractional dosage. I expect to apply a massive dose to the entire lesion and will take pleasure in showing the results of treatment at a later date.

Case 1. Female, aged 68 years. Diagnosis: epithelioma of left cheek; duration more than ten years. There was a pear-shaped lesion extending from under left eye to a little below the margin of the nose, and from side of nose to and involving malar bone. There was a sloughing, ulcerated, necrotic surface surrounded by an infiltrated border rolling inward, studded with the pearly bodies characteristic of epithelioma.

The treatment consisted of 25 milligram tube of radium with $\frac{1}{2}$ millimeter silver filter



Case II—After treatment

at a distance of two centimeters over three areas for a total of 525 milligram hours on January 2, 1920, with the result which may be seen.

Case 2. Female, aged 60 years. Diagnosis: epithelioma of forehead; duration twenty-five years; started from wart on forehead; for eighteen years remained the size of a silver quarter. The patient has been under treatment for the last fifteen years with high frequency current, electric needle, roentgen-ray and etc. It will be noted there is a large ulcerating area covering entire left side of forehead, extending into scalp at its upper

border, the lower involving the upper left eyelid and extending slightly over temporal region. The lesion presents all the usual characteristics of basal cell epithelioma, and its long duration and slow growth, as well as the clinical signs, place it in the basal cell type.

The fact that this lesion is of slow growth argues that malignancy is of a low type, and I hope to produce healing of the entire surface with one massive dose of the roentgen-ray. Later massive doses will be given if necessary to heal isolated areas of infiltration which may have escaped the first dose. The only reason for not getting a pleasing result in cases of this type is that the neoplasm may have changed to a more malignant type irrespective of the extent of the area involved.

Of the different methods employed in the treatment of basal cell epithelioma, the roentgen-ray and radium deserve first place. Not only is the percentage of cures as high as by the application of other measures, but certainly the cosmetic effect is much more favorable. The choice of the two agents depends upon the location of the part to be rayed, rather than any difference in the action of these measures. The time consumed in treatment is to be considered, and the extent of the area to be rayed may play some part in the selection.

There are anatomic situations where the radiation of lesions by the roentgen-ray is an impossibility, and the same is true of the application of radium; for example, the inner canthus of the eye. Where the area to be rayed is sufficiently large to require a number of applications of radium to cover the lesion, the danger of overlapping is obviated by x-ray therapy. The time of application of the roentgen-ray is measured by minutes, whereas, that of radium is a matter of hours. Time being the only factor to be considered, the x-ray should naturally be given preference.

MacKee claims basal cell epitheliomata which have resisted the x-ray will in some instances respond to radium; but he has never seen one not benefited by radium be cured by the x-ray. That has not been my experience. What he means to say, I judge, is using the Gamma rays of radium where the unfiltered rays of the x-ray have failed.

The percentage of cures obtained by different operators varies considerably, and the most plausible reason is that different bases upon which radio-therapists estimate a clinical cure. It is a well established fact that if any of the neoplasm remains, the lesion will at some time in the future recur. The

question of importance is "what constitutes a clinical cure?"

My idea of a clinical cure is where the lesion itself is reduced to a smooth, pliable scar and the surrounding tissue shows no evidence of infiltration. Often times it is difficult to induce the patient to submit to another application of the ray, the small scar and seemingly good result being perfectly satisfactory to him; whereas we may know from the infiltration present that there is still active pathology which will eventually manifest itself in a so-called recurrence.

I have a case in mind in which the lesion disappeared after the first dose of the roentgen-ray and the patient was delighted. At the edge of the diseased area there was slight infiltration which again became active, and a full (massive) dose was required to effect a cure. It is difficult to make these patients understand the necessity of two or more massive doses, and for that reason I seldom speak of accomplishing a cure by one application.

The question of massive and fractional dosage has caused much discussion. Dr. W. A. Pusey is the chief exponent of fractional dosage, and, of the large number of men recognized as proficient in these treatments, the only one who has attained marked success. Dr. Pusey's success has been attributed to his skillful application and knowledge of the roentgen-ray, and with this I am in perfect accord.

In massive dose radiation we give a fixed amount of ray. Reaction occurs from the eighth to the fourteenth day, according to the amount of the ray given. Vesiculation, crusting, erythema, etc, are then allowed to subside before a second dose is considered. We have methods of measuring the dosage with a fair degree of accuracy, and the idiosyncrasy of the patient, about which we sometimes speak so glibly, is more of a protection to ourselves than a reality. It is seldom that a third degree burn is received in massive radiation, and when it occurs the most probable explanation is overlapping where several lesions are adjacent.

In the fractional dose method a number of complications may arise which require greater skill than in the massive dose method. In piling fractional doses upon one another the cumulative effect has to be borne in mind, and if a sufficient dose be given to affect the lesion the operator must consider a greater number of factors than where massive doses are used.

It is a well known fact that radiation (radium and roentgen-ray) will expend its force upon the tissues of the area radiated. Therefore, the one giving massive dosage is more

within the limits of safety than the one who uses fractional doses on account of the cumulative effect; and the reason for Dr. Pusey's success is rightfully attributed to his skill and knowledge rather than to the fact that fractional doses are safer when used to the erythema stage.

My practice has always been to treat a basal cell epithelioma with one massive dose, the amount of the ray and the filtration being governed by the character of the lesion. In all cases the maximum dose is given when the lesion is first rayed. Subsequent doses when necessary in ideal cases should be less than the first.

In lesions with little infiltration or ulceration the unfiltered rays are employed. In elevated lesions it has been my practice to curette the lesion to the level of the surrounding skin. Any crusts are removed prior to radiation as they act as a filter and also obscure the extent of active lesions.

The area beyond the lesion to be rayed is just as important to the radio-therapist as to the surgeon, and always one-fourth inch of normal skin surrounding the lesion is included in the radiation. Where there is any doubt as to the nature of the lesion, and excision is practicable, excision is always advised especially where the resulting scar is of minor importance; the operation to be followed by application of the roentgen-ray or radium. The mistake of the surgeon is usually the same as that of the radio-therapist, i. e., limiting the area to be sacrificed or rayed to the lesion itself, and it is to this fact that I attribute a large percentage of the recurrences.

The squamous and prickle cell epitheliomata are more resistant to the roentgen-ray and radium, and should be treated with greater respect by the radio-therapist. The knowledge that many basal cell epitheliomata may assume a more malignant form should always be remembered, and if the lesion refuses to respond to (at most) three massive doses, the tumor should be excised and if necessary plastic work done. There are clinically typical cases of basal cell epithelioma which do not yield to the ray, and the non-recognition of these cases until too late has caused the roentgen-ray and radium to be condemned by certain surgeons.

One of the greatest advantages of the massive dose method is that the operator soon arrives at a definite conclusion as to whether the lesion is amenable to the ray; whereas, with fractional doses the treatment extends over a long period of time and the tendency is to refer the patient to the surgeon too late for him to secure a favorable cosmetic effect,

and in some instances metastasis has already occurred.

As to the preferability of the knife over radiation in basal cell epithelioma: I believe with the Coolidge tube, which gives a constant ray, we have a means of treating such cases superior to the knife, and the cosmetic results is unquestionably more favorable. The advent of the Coolidge tube is so recent that statistics have not been compiled to prove this assertion. To those familiar with radio-therapeutics as practiced with gas and hydrogen tubes, the advantages are appreciated much more than by those who have used only the Coolidge tube. The constant ray from the Coolidge tube gives an exactness in our work which cannot be attained with gas or hydrogen tubes. For this reason, as well as the fact that we are becoming more proficient in early diagnosis, our percentage of cures should become greater.

Of the different caustics used only one seems deserving of mention, viz, the acid nitrate of hydrargyrum. This in the hands of a few men has given favorable results, but the cosmetic effect is not so good as that obtained by radiation; and the acid being applied only to the lesion itself and not on a margin of normal skin surrounding the epithelioma, the chance of recurrence is infinitely greater.

It is not uncommon for a patient to come in who has been under treatment by local applications of acid nitrate of mercury to the margins of the growth at intervals of six months, extending over a period of three to ten years, which has merely acted as a stimulus to further development, the lesion being three or more times its original size. With massive dose radiation this should not occur as the radio-therapist should in all cases know within three months whether the epithelioma is responsive to the ray, and by including a margin of normal tissue surrounding the tumor it will not have increased much in size should it later become necessary to refer the patient to the surgeon.

In the microscopic diagnosis of epithelioma one is able to differentiate with a fair degree of accuracy between the basal cell and other more malignant types. The moderate amount of infiltration and long duration render the diagnosis comparatively easy. The location of the lesion is also important. When a patient has patches of seborrheic keratosis on the face and one or more ulcerated areas slightly infiltrated with pearly borders and rolling edges, the natural supposition is that we have to deal with a basal cell epithelioma; whereas, if there are similar lesions on the hands or body we conclude they belong to a more malignant type.

In the treatment of skin cancer I have always been governed by the degree of infiltration, and where the lesion is deeply infiltrated I prefer excision followed by radiation. In cancers of the face above the lower lip, the roentgen-ray or radium is always worth a trial. There being no metastasis I believe skin cancer on or below the lower lip should be excised with a wide margin of tissue. When metastasis has occurred the glands of the neck should be removed first. Should there be no glands palpable, radiation should be always practiced prior to the invocation of surgery with the idea of blocking possible metastasis at the time of operation. It is obviously impossible to always determine with certainty whether or not there is any glandular involvement, and while not entirely germane to the subject I desire to report one case of sarcoma of the wrist to emphasize this point.

(1.) Mr. C. J., aged 23 years. Diagnosis: sarcoma of wrist. The patient was operated upon six weeks before and mass on the extensor surface of right wrist removed. Examination revealed right wrist twice the size of left with scar on extensor surface. Patient complained of pain at times and was unable to do any manual work. No roentgen-ray plate nor examination of excised tissue at time of operation. There was no evidence of glandular involvement at elbow or in axillary space on affected side. I might say that before coming to me this patient had been examined by three physicians experienced in cancer work.

The treatment consisted of a 2 H. skin dose of roentgen-ray filtered with 3mm. of aluminum. Number of doses four, one anterior, one posterior and two lateral, using the entire wrist for radiation. Five weeks later the lesion was about one-fifth its original size. Upon examination a nodule the size of a pea could be felt in the axilla. The supra- and infra-clavicular regions and axilla were "cross-fired," and the nodule disappeared. The wrist continued to improve, and the patient considering himself well, did not return for further treatment.

This case brought before me so forcibly the possibility of metastasis that I have since made it a routine custom to ray probable paths prior to the institution of local treatment irrespective of negative findings.

(2.) Mr. M. E., aged 63 years, occupation fireman, was sent to me for treatment because of an epithelioma on the left malar region. The lesion was the size of a silver half dollar, ulcerated partially covered with crust, with an island of scar tissue in center. The neoplasm presented all the characteristics of a basal

cell epithelioma, with a moderate amount of infiltration and pearly border slightly raised and rolling inward.

A massive dose of 2 H. unfiltered roentgen-ray was given May 10, 1919. By July 1, the erythema and crust from the ray had disappeared leaving a smooth, pliable scar which may still be seen. If this lesion be closely examined the margin of normal skin which was included in the treatment can be plainly noted. This patient was treated on eight different occasions by the application of acids before being sent to me. The lesion was about the size of a split pea when first treated with acid, and became larger with each recurrence.

I am presenting this case not with the idea of claiming superiority of radiation over caustics, but to show the cosmetic result which may be attained by this method when properly applied. The outcome is far better and was accomplished with much less trouble than could have been done by the plastic surgeon. This patient has a small nodule on the nose which has received no treatment.

(3.) Mrs. R., aged 65 years, presented a number of seborrheic patches on the face, and a "V" shaped ulceration on forehead to left of median line. Near outer canthus of right eye there was an elevated lesion with decided infiltration and depressed ulcerated center size of split pea. Diagnosis: basal cell epithelioma.

Both these lesions were given unfiltered treatment with radium for eighty minutes each on July 28, 1919. The result so far as the epithelioma on the forehead is concerned is all that can be desired. The other lesion has entirely healed, but a moderate degree of infiltration still persists which will require an additional dose.

In presenting this case I wish to call attention to the importance of filtration. Had my radium been properly filtered there should have been no necessity for a second dose.

(4.) Mr. S. B., aged 59 years, had an elevated lesion on left side of nose size of lentil bean covered with crust. Lesion curetted to level of surrounding skin and radium applied for eighty minutes. This patient also had a seborrheic patch on right side of face to which radium was applied for sixty minutes. A biopsy was made on tissue curetted and found to be an epidermoid carcinoma with proliferation of squamous cells.

The result is a seeming cure, but the patient will be kept under observation and carefully examined from time to time for evidence of recurrence.

Conclusions:

(1.) That the roentgen-ray or radium, owing to the superior cosmetic results, is the choice of agents in the treatment of basal cell epithelioma:

(2.) That massive dose radiation is more effective in its results than fractional doses:

(3.) That massive dose radiation is safer to the patient than fractional, both being carried beyond the erythema stage:

(4.) That skin cancers of the face, on or below the lower lip, should be excised rather than rayed:

(5.) That points of possible metastasis and also developed metastasis should be rayed or removed before the local lesion is treated by either radiation or surgery.

(6.) That all infiltration however small in known cancerous areas should be regarded with suspicion and resolved before a clinical cure is claimed.

DISCUSSION:

D. Y. Keith: I saw the second patient exhibited by Dr. Young some time last fall. The lesion was originally of a type that could have been cured by anyone using radium or the roentgen-ray. However, the patient was first treated by surgery, then with actual cautery, high frequency current (fulguration) carbon dioxide snow, then the roentgen-ray. If radium or the roentgen-ray had been used in the beginning she could have been cured easily.

This type of tumor though easily cured is made very malignant when so many procedures have been used, as in this case.

W. J. Young: In regard to the treatment of the second case shown: If the neoplasm is a basal cell epithelioma, which I have every reason to believe it is, one massive dose of either the roentgen-ray or radium should produce local healing. Either the roentgen-ray or radium in massive dosage will improve chronic cases of this character. In this case the roentgen-ray will be used owing to the large area involved. With this agent it will be possible to secure even radiation of the entire area, whereas radium would have to be applied over not less than twelve to sixteen spaces, and it can readily be seen how one might overlap the dose.

I hope to again exhibit this patient within two months, at which time I believe considerable improvement will be noted. A massive dose of the roentgen-ray will be applied within the next few days.

Wallace Frank: I agree with Dr. Young that in the treatment of basal cell epithelioma about the upper part of the face successful results may be secured by the use of either radium or

the roentgen-ray. The location of the neoplasm, as he has stated, must be considered before deciding which agent is most applicable. Decidedly less scarring occurs and better cosmetic results are secured from radiation than surgical treatment.

As to "blocking" the areas adjacent to the neoplasm before radiation or surgical removal: If the tumor is amenable to treatment by either roentgen-ray or radium I can see no necessity for the "blocking" procedure prior to radiation of the growths as treatment immediately inhibits tumor growth.

Surgical removal is an entirely different proposition and "blocking" is advisable previous to operation in order to close the lymphatics in that area and thus prevent dissemination of the disease.

D. Y. Keith: Those of us who have used the roentgen-ray in treating epitheliomata superficially situated on various parts of the body have probably had about the same results as demonstrated by Dr. Young. While I have had no personal experience with radium in this class of cases, from a study of the literature I cannot see that it has any advantage over the roentgen-ray.

As Dr. Young has said, in epithelioma of the lower lip, especially where metastasis has already occurred, surgery is the only thing to be considered. In all such cases, however, the lymphatics should be "blocked" with a massive dose of the ray before operation and several applications made after operative treatment. If surgeons would follow this plan I believe their percentage of cures would be greater. In epithelioma of the face anywhere above the upper lip the cosmetic result should be good from radiation if treatment is properly applied.

Personally I have treated but few cases with fractional doses of the roentgen-ray, the massive dose method being invariably used. I believe Dr. Pusey, of Chicago, is the only man of any prominence in the country who is still using the fractional dose method. I heard him say at the last meeting of the American Medical Association that his reason for using fractional doses was that he began that way and as his results had been satisfactory he could see no reason for changing his method.

Cases of epitheliomata of the face are occasionally encountered in which there is a tendency to ulceration and persistent glandular enlargement. The results which can be secured from massive roentgen-ray treatment of the tumor and the glandular areas are sometimes surprising. This is well illustrated by a case which came under our observation last summer. A man, aged 66, had a saddle-shaped epithelioma involving the entire nose, also a large ulcerated tumor on his neck posteriorly surrounded by considerable in-

duration. We removed the crust from the ulcerated area and applied roentgen-ray treatment in massive doses. There was extensive infiltration of the glands of the neck and these areas were also included in our radiation. Improvement was rapid, the man gained twelve pounds in weight within six weeks, the ulcerated area on his neck healed promptly as did also the lesion on his nose. He has returned to his work and is apparently well. He still comes in occasionally and is given a dose of the rays with the idea of preventing any recurrence. In this case the disease had progressed beyond the point where surgery could have accomplished anything.

Some operators refrain from treating epitheliomata involving the eyelids with the roentgen-ray. If the eye is properly protected lesions of the lid can be treated just as successfully as anywhere else.

We believe in the future we will see much surgery for both superficial and deep malignancy with a higher percentage of cure; certainly we will see an extension of life, the patient being more comfortable than where extensive surgery is done with early recurrence. Our opinion in this class of patients is that they are never again comfortable after operative procedure has been instituted.

W. J. Young, closing: Referring to Dr. Frank's remarks, one of the points I tried to emphasize in the paper was that it is sometimes impossible to determine whether or not metastasis has occurred; nor can infected, infiltrated lymph glands always be detected simply by palpating areas adjacent to the neoplasm. For these reasons I have always considered it advisable to "block" the lymphatics surrounding the original lesion as thoroughly as possible before attacking the lesion itself either surgically or by the application of radium.

I think it always advisable to administer ray treatment—be it radium or x-ray—after excision by the surgeon to further insure against recurrence. The fact that recurrence is always along the line of scar tissue or at some place where a ligature has been applied gives strength to the theory of transplantation, and by radiation this may be inhibited.

Concentration of Acetone in Blood.—E. M. P. Widmark introduced a known amount of acetone into the blood and afterwards determined the concentration at certain intervals through the day. A formula was constructed from these data. The average concentration in one healthy subject was 0.1 pro mille, corresponding to an absolute amount of 5.7 gm. To maintain the said concentration, a supply of 5.3 gm. per day was required. This may prove of value in the study of the acetone balance in diabetes.

DIAGNOSIS AND TREATMENT OF PERIPHERAL NERVE INJURIES*

By B. F. ZIMMERMAN, Louisville

It is believed that the frequency of nerve injuries complicating the accidents of civil life is sufficient justification for the presentation of this paper. No attempt has been made to enter into the highly refined technique of neurological surgery. The object has been rather to review the symptoms and point out the more important diagnostic points with which we are all more or less familiar, and to emphasize the importance of early recognition of injury and the employment of appropriate simple measures necessary to a successful recovery. An intimate knowledge of the anatomy and physiology of the nerves is indispensable to success.

The function of the nerve fibre is to conduct impulses. These impulses are motor, sensory, vasomotor and trophic. Injury to a nerve interferes with normal conduction. If the nerve is completely divided no impulses of any kind will pass the gap. If the nerve is compressed there will be interference of conduction which varies with the intensity and duration of the compressing force. A nerve may be partly divided, the remaining portion cut and compressed. This gives a more complicated clinical picture than either simple division or compression. Finally the nerve may be but slightly injured, but the conditions are such that prolonged irritation results, giving rise to abnormal and excessive impulses.

Since in all cases except those with open wounds the exact extent of nerve injury cannot be seen, reliance must be placed upon a careful analysis of all symptoms and the proper correlation of the data thus obtained in arriving at a proper diagnosis. Furthermore, the sequence of appearance and disappearance—the evolution—of symptoms is of great value in determining the extent of injury and hence the kind of treatment necessary.

In an atypical interruption it is the completeness and permanence of arrested function that is characteristic. The symptoms coincide with the area of distribution of the injured nerve. Paralysis of the muscles supplied by the nerve is immediate, complete and invariable. There is rapid and progressive loss of muscle tone until complete hypotonia results. Muscular atrophy is rapid and is recognized by the changes in electrical reaction which appear in two or three weeks

and progress to a complete reaction of degeneration.

There is immediate complete and invariable anesthesia affecting all modalities of sensation in the area of the nerve distribution. There is an absence of spontaneous pain or pain on pressure over the affected nerve or muscle bellies.

Trophic disturbances are slight. There are usually slight changes in skin and nails and hypertrichosis. Vasomotor changes are not marked. There may be slight oedema and cyanosis. The reflexes in which this nerve participates are abolished.

Simple compression may produce all the symptoms of interruption but they are less intense and more variable. As has been stated, the completeness of the analogy will depend upon the intensity and duration of the compressing force. In general it may be said that the disturbance of function is never as complete as in interruption.

Muscular tone is seldom completely lost. This is a valuable sign in differentiating between interruption and compression. Anesthesia is more variable and less complete. By frequent careful examinations the anesthetic field will be found to change with returning function.

Nerve interruption and compression are not followed by fibrous contractures. Such deformities as are produced are easily reducible. They are of the "soft" variety.

In nerve irritation the predominating symptoms are trophic. Paralysis may be slight and sensory disturbance unimportant, but there are vast trophic changes of skin and its appendages, of tendons and tendon sheaths leading to dense adhesions which result in hopeless contractures. Even the bones and articulations, particularly of the corpus, become the seat of extensive changes resulting in fibrous ankylosis. Spontaneous pains and pain on pressure over the affected nerve and muscles are present. (Vasomotor changes may be marked.)

In the case of certain nerves, particularly the median and sciatic, the pain may reach the extreme degree known as *Causalgia*.

The symptoms of nerve irritation last for months and often result in permanent disability.

Careful search for nerve injury should be made in all fractures and wounds, of the extremities, and in all wounds elsewhere in the body where nerves are liable to be involved. It is important to recognize such damage at once in order that appropriate treatment may be instituted early. In the case of some nerves, as musculo spiral, sciatic external popliteal, the lesion is easily recognized by the

*Read before the Kentucky State Medical Association, Ashland, September, 1919.

predominance of the motor symptoms. Substituted movements in the case of musculo spiral and external popliteal are impossible and the characteristic deformities can be recognized almost at a glance. The paralysis of the median and ulnar substitution movements are innumerable and a careful analysis of symptoms is necessary. It is in such cases that complete knowledge of the anatomy and physiology is imperative.

Peripheral nerve lesions are differentiated from lesions of the central nervous system by the history, location of injury, by the fact that paralysis of central origin is spastic and not flaccid, that the reflexes are increased and that the paralysis does not coincide with the distribution of the peripheral nerves. In paralysis of central origin more frequently the entire limb is paralyzed, but if the lesion is in the cord and is small paralysis may be limited to certain muscles of the extremity. In such a case the paralysis is segmental or of the root type and does not correspond to any given nerve.

When the root of the nerve is involved as in avulsion there is the same distribution of symptoms that would obtain in injury of the cord segment from which the root took its origin. In root irritations, usually syphilitic, there are other symptoms of meningeal irritation, and changes in the cerebro-spinal fluid which makes the diagnosis possible.

In peripheral neuritis there is a history of infection or intoxication and the lesions are usually bilateral.

Functional paralyses often present a puzzling picture, particularly when there has been some slight injury to a nerve, usually a sensory nerve. In this class must be placed the paradoxical contractures studied by Froment and Babinski.

Prolonged inactivity in a susceptible patient may result in a pseudo-paralysis that is at times puzzling. Pseudo-paralysis may result also from pain.

In certain subjects paralysis of a purely sensory nerve may suggest that the motor nerves also are involved, with the result that voluntary effort is inhibited.

Hysterical paralysis can usually be diagnosed by the history, mental state of the patient, and the stigmata taken in conjunction with the peculiar disturbance of motor paralysis and anesthesia, violating as they do all anatomical and physiological laws. An interesting feature of hysterical paralysis is that often the patient is indifferent to his affliction.

In these functional lesions the muscles do not show the electrical changes shown by or-

ganic paralysis. This is an important point in the diagnosis.

Finally, fibrous contractures following trauma or infection of articulates or tendons may simulate contractures due to the nerve irritation. The history will usually be sufficient to establish a diagnosis. In this connection mention must be made of ischaemic paralysis, particularly of the upper extremity, when the contractures simulate those of combined median and ulnar irritation. Here, again the history of injury to or occlusion of the brachial artery, or of the tight application of splints is important. The radial pulse is usually small. The muscles are of a peculiar woody hardness. There is nerve involvement, but it is not of the same distribution as that found in paralysis or contracture from nerve injury alone.

If it can be clearly demonstrated that there is complete interruption of the nerve, and this cannot as a rule be done unless one is dealing with an open wound, immediate suture under the strictest aseptic precautions is indicated. If from the nature of the wound or from environment this cannot be done, then the operation should be postponed until such time when it can be done.

If doubt exists as to the extent of damage done to the nerve then it is wise to wait and carefully examine from time to time for signs of regeneration. The most important signs of regeneration are contraction of the anesthetic field and return of muscle tone.

It seems that nothing is lost by a delay of two or three months, which is sufficient time to establish a probably correct diagnosis.

During this period of waiting other measures are to be employed, and are to be continued before and after suture, until the maximum results are obtained. It is a long course of treatment and one that taxes our patience.

When a group of muscles are paralyzed as a result of nerve injury, a certain amount of deformity is a result. This deformity is a result of the tonic contraction of the antagonistic muscles. If this deformity is not corrected changes occur in both groups of muscles. The paralyzed muscles and tendons are overstretched and may become permanently elongated, so that when nerve regeneration occurs the muscles are functionally useless.

The antagonists, on the other hand, become contracted and shortened and after a time the tendons adhere to their fibrous sheaths. The result is an irreducible contracture which the paralyzed group cannot overcome after their recovery. It is necessary, therefore, to correct the deformity by appropriate splinting. Two views obtain as to the amount of correction necessary to obtain the best re-

sults. One is that there should be over correction; that the paralyzed muscles should be completely relaxed. The other view holds the correction should be sufficient only to place the muscles in a position of physiological rest. The writer has tried both methods and as a result is at present an advocate of the second method, that of placing the muscles in a position of physiological rest.

Corrective splinting after deformities have occurred, as in nerve irritation, is employed to correct contractures. Great care must be exercised in reducing the contractures. It should be borne in mind that in contractures tendons, ligaments and muscles are involved. The muscles being the only soft structures are the most susceptible to injury. Great care should be used not to rupture the muscles.

The splint material should be light and the splint should be easy of application, for it must be frequently removed to admit of the application of other therapeutic measures—heat, mechanotherapy and electricity.

It probably makes little difference what form of heat is employed. The object is to produce hyperaemia, which in turn improves the nutrition of the muscle.

The best instrument for the application of mechano-therapy is the human hand. There are many mechanical devices employed but none are as good as careful massage by the hand. It is desirable always to have a well-trained operator. The manipulation should be very gentle at first, gradually increasing in vigor. Massage improves nutrition where wisely employed.

There are various kinds of electrical currents used. The galvanic, faradic and high frequency. The galvanic and faradic are used to produce muscular contraction thereby exercising the muscles which are deprived of their normal source of stimulation, the nerve. In general it may be said that that type of current which will produce the best contraction is the one to be employed.

The high frequency current produces heat and hyperemia. The heat is greater at some depth than it is on the surface. For this reason it is particularly useful and where properly applied is not painful. In giving these treatments it is necessary to remove the splints. In so doing great care should be used that the paralyzed muscles be not overstretched. A few moments of over stretching will undo weeks of treatment.

Internal Treatment for Ulcer of the Stomach.—Oehnell advocates invariably medical treatment unless the niche does not disappear, which it did in thirty-one of his thirty-four cases under medical measures.

THE CLINICAL SIGNIFICANCE OF THE WASSERMANN REACTION*

By WILLIAM J. YOUNG, Louisville.

One of the discoveries of greatest moment in recent years, as an aid in the diagnosis and treatment of syphilis, is the Wassermann reaction, or the so-called Wassermann test.

Wassermann, in 1906, working with Neisser and Bruck, brought to the medical profession a practical blood test for the detection of lues. Although the test bears the name of Wassermann, it was based upon the work previously done by Bordet and Gengon in the fixation of complement. Objection to the use of the term "Wassermann test" has recently been raised, as it might be confusing to have tests reported as "Wassermann tests" which are based on principles and technique far removed from the original water soluble syphilitic liver antigens used by Wassermann and who erroneously thought the reaction was a specific one.

The Wassermann reaction is a delicate one depending upon many factors. It is beyond the scope of this paper to describe the test in detail with its numerous modifications. It is essential, however, for the physician to know that reports are reliable only when tests are made in well-controlled laboratories, and that the Wassermann findings are to be regarded, so to speak, merely as one symptom of lues rather than a basis for positive diagnosis. Clinical observation and history must always be considered and bacteriological investigations should be made whenever occasion arises.

The Wassermann reaction is designated by the following terms:

Four-plus (++++),
Three-plus (+++),
Two-plus (++) ,
One-plus (+),
Plus-minus (+—),
Negative.

The Board of Health of one of our large cities advisedly states on the back of each report that it sends physicians the following: *Interpretation of Wassermann Readings*—Four-plus means very strongly positive. Three-plus means strongly positive. Two-plus means positive. One-plus means weakly positive. Plus-minus means doubtful. Negative means negative.

A report of +++++, and personally I believe I am safe in adding also a +++, from a reliable

*Read before the Louisville Medico-Chirurgical Society.

and painstaking laboratory, undoubtedly means that the patient has latent or active syphilis. The so-called "paradoxical ++++" or non-specific positive reaction, occurs in frambesia tropica (yaws) sleeping sickness, and in nodular leprosy; but these diseases are rare in this climate and need little consideration here. Slightly positive reactions may occur in tuberculosis and perhaps in measles and scarlet fever.

A ++ Wassermann is very suspicious of lues, but before a positive diagnosis is made it should be confirmed by history or clinical manifestations.

A + is suspicious of lues, and requires careful checking as already stated to confirm the diagnosis.

A +- and negative Wassermann without either history or clinical symptoms is assumed to indicate the absence of syphilitic infection.

A negative Wassermann alone should never under any circumstances be considered proof of the absence of syphilis; it only indicates an absence of the characteristic reaction; the Wassermann must be regarded merely as one of the diagnostic features, just as is the Widal in typhoid fever and the Von Pirquet in tuberculosis.

To consider briefly the different stages of lues and the usual Wassermann findings: In primary syphilis, the period of chancre, the Wassermann reaction is negative, although spirochaetae pallida are found in the lesion. This is the most consistent negative we get. Later in the primary stage, when the lymph nodes which drain the area of the chancre become enlarged, the Wassermann becomes positive.

In the stage of generalized eruption of the disease, the so-called secondary stage, the Wassermann is regularly positive and is usually very strongly so. A case recently observed illustrates these points clearly:

W. R., male, aged 25, came under the observation of a colleague for supposed ulcerating herpes of the penis. The doctor undertook to have a blood test made to exclude syphilis. The Wassermann reaction was negative, and the patient was assured there was no syphilitic taint. The patient was later seen in consultation at which time he presented a typical macular syphilitic eruption, and the Wassermann was then strongly positive. Unfortunately such cases could be multiplied many times in the experience of most syphilologists.

In the third stage the Wassermann is positive in approximately 85 per cent.

It is the negative Wassermann findings which most frequently call attention of the

physician to the fact that in some instances this test cannot be regarded as final proof. Many cases of syphilis would escape detection if the negative Wassermann was allowed to be made the last word. Even after provocative arsphenamin has been given, the Wassermann remaining negative, should there be clinical symptoms indicating the presence of lues, a therapeutic test would be required to give the patient a clear bill of health.

In neurosyphilis it is not uncommon to have a negative blood test. However, the spinal fluid findings usually furnish evidence of the disease.

In ocular syphilis the Wassermann reaction is very often contrary to specific infection, and the therapeutic test alone will confirm the diagnosis of the oculist.

The proctologist is frequently confronted with negative Wassermann findings in cases which subsequently yield to anti-luetic treatment, and so one could enumerate the different specialties in which a negative Wassermann may be the means of throwing the observer off his guard should too great reliance be placed upon this valuable aid to the exclusion of other clinical signs.

To cite one such case: J. M., male, aged 55, had a tumor of the rectum. He had had intensive anti-syphilitic treatment over a period of three years with a number of negative Wassermans, and was referred to a surgeon. The rectal tumor was so situated that if malignant its complete extirpation was problematical. The surgeon suggested that a therapeutic test be made, and the patient was given arsphenamin by intravenous injection, whereupon the tumor-mass began to slowly resolve and after anti-luetic treatment had been continued for the requisite period of time the tumor entirely disappeared.

Another important point in the interpretation of the Wassermann findings is the frequency with which we are confronted with a ++++ and a co-existing skin manifestation of some other disease, or associated with cancerous lesions of the skin. It is easy to understand, with ten per cent of the population of the world syphilized, the possibility of a syphilitic individual having a skin disease simulating a secondary eruption or a gummatous lesion.

The dermatologist is often called on to exclude syphilis, and woe betide him, after examining the dermatological manifestations, if he states positively that the patient has not syphilis. It has always been my practice to diagnose the eruption present if practicable, and at the same time to explain the possibility of generalized syphilis, not depending upon the manifestations present. Only recent-

ly two cases illustrating this point came under observation:

Y. Z., male, aged 49, gave the history of a genital chancre 25 years before. He had recently noticed a small lesion on the left side of his nose which gave him no subjective symptoms. He consulted his physician and made a clean confession of his past history. The doctor made a blood test and the report was strongly positive, and on this evidence anti-luetic treatment was instituted. The lesion did not recede with treatment but rather progressed. When seen in consultation the man presented an inoperable cancer of the left side of his nose encroaching on the lower eyelid.

F. W., male, aged 68, presented an ulcer under right side of tongue the size of a twenty-five cent piece. The lesion had an ulcerated center with infiltrated margins and base. He was referred to me with the diagnosis of cancer. This patient's blood had previously shown a negative Wassermann, and he had been given arsphenamin and mercury with no result. X-ray treatment was applied to points of metastasis and radium needles thrust below cancerous lesion which resulted in a clinical cure. Four months later metastasis developed under right side of jaw and the patient is losing ground rapidly. These cases are unfavorable for permanent cure, but undoubtedly this man's chances would have been better had a correct diagnosis been established at the outset.

The practice of treating patients with Wassermann findings ++ or + without suspicious history or clinical manifestations, or the giving of arsphenamin in the absence of suspicious skin lesions as a check for therapeutic test, cannot be too strongly condemned. These patients drifting into the hands of other physicians present a problem unsolvable. The physician has the choice of two evils: First to assume that the patient has syphilis, or, second, to tell the patient that he is unable to make a diagnosis of syphilis and refuse to treat him. In the first instance we give the patient the benefit of the doubt, and do him no material harm even though he has never had syphilis. In the second we turn loose a confused individual unable to form an opinion of his own and unable to get one from anybody else. Of the two evils I believe the first is the lesser and productive of greater good to the patient's mind even though he be non-luetic. Those of us who have witnessed the mental sufferings of individuals with syphilophobia can realize that any amount of treatment is preferable to even the chance of the patient becoming one of this type.

To cite two cases: E. S., male, aged 32, gave history of a sore on his penis with a duration of six days, two years ago, no microscopic examination made. His blood Wassermann at the time was negative. Notwithstanding this he was given six injections of arsphenamin and ten of mercury. This treatment covered a period of one year. He has had seven negative Wassermans at different times. This patient came to me for anti-luetic treatment, and after investigating his history he was told that he might have had syphilis, but based upon the information he had given me I was led to believe the chances were he had never been infected. He was given by me a course of six injections of arsphenamin and fifteen of mercury, and told he was being treated more for his peace of mind than anything else. He has since been relieved of his mental strain, and with his constant negative Wassermann I hope to control him without further treatment unless some new development occurs.

P. J., a male, aged 28, had a sore on his penis. Wassermann negative, no spirochætae found. Diagnosis of syphilis was made by his physician who administered arsphenamin twice a week as an abortive measure, four doses having been given when this patient came to me for diagnosis after having seen three other physicians. On examination the epitrochlear glands were found enlarged, also the inguinal glands on both sides. There was a small infiltrated lesion on the corona glandis. He was told it would be impossible for me to make an absolute diagnosis of lues, and he was advised to return to the physician who first instituted treatment as the signs present were in favor of his having lues. This patient will always present an unsolved problem as to whether or not he has syphilis, and just what effect it will have on his future treatment or lack of treatment is a question. Had spirochætes been demonstrated in the penile lesion all this worry might have been obviated.

It is to be hoped that I have in no way minimized the importance of the Wassermann reaction. It was with the hope of more firmly establishing its usefulness as an adjunct in the diagnosis of syphilis that this paper was written. The Wassermann reaction is probably the greatest tool in syphilis in the possession of the medical profession today, but like other routes to diagnosis it should be used in conjunction with other findings. The clinician of the present will find himself outstepped if his dependence upon the Wassermann reaction is permitted to obscure his clinical knowledge of the dis-

case, and his "bed of roses will be productive of many thorns."

Conclusions:

1. The Wassermann reaction is a most important factor as an aid in the diagnosis and treatment of syphilis.

2. That unless it be used conjointly with the older means of diagnosis the findings may be misleading.

3. That considered alone its diagnostic value is only to be depended upon when a ++++ Wassermann is found, "paradoxical ++++" being excluded.

DISCUSSION:

Stuart Graves: I think Dr. Young's paper is an excellent one and has brought out some very important points that every clinician ought to know and yet many of them overlook. He "hits the nail on the head" at the outset by saying that the Wassermann reaction should be regarded merely as a symptom of luetic infection. As that term is one which is naturally comprehended by every general practitioner, if it were looked upon in that light it would probably save a great many mistakes in diagnosis and more particularly in the treatment of syphilis.

Judging as nearly as possible by the clinical history that is observed, and I see literally thousands of blanks that are sent in to the laboratory with specimens of blood, particularly those from the hospital wards and the out-patient department where the doctors send the clinical history with the specimen, I think it safe to say that four-plus and three-plus Wassermann reactions always mean syphilis or leprosy in this part of the country. I think I have examined the blood in six cases of leprosy and found all four-plus. In these cases syphilis could reasonably be excluded by the history and the clinical symptoms.

A two-plus Wassermann I think is practically always a symptom of syphilis if the reaction is properly controlled. In fact, everything that anyone has to say on the Wassermann is to be based upon the hypothesis that the Wassermann reaction is done with a properly taken specimen of blood, with proper controls, and with at least two antigens. One-plus and plus-minus I think should always be interpreted in the light of the clinical history and the clinical symptoms. There is no doubt whatever that the blood of patients with acute infections, sometimes tumors, pregnancies and other conditions may show a degree of complement fixation which is not syphilitic. Moreover, it has been established by a good many syphiliographers that complete reactions will sometimes disappear and no explanation can be offered; that is, with the same technic, the same factors, and the same specimens of blood, weak reactions will occasionally be ob-

tained which are non-specific. In the light of a negative history and negative symptoms such reactions should be disregarded. Every good serologist has found that to be the case, and every clinician who has worked in close relation to the serologist will confirm that point. On the other hand, many times one-plus will suggest syphilis and should be followed by other reactions, by careful study of the case clinically, sometimes by a provocative or therapeutic test. Right here I would like to say, in regard to these weakly positive reactions, that we must differentiate between positive complement fixation in any degree and a positive Wassermann as a sign of syphilis. I mean by that we may get even less than 25 per cent inhibition of hemolysis and yet we have positive complement fixation. Many times the difference between such positive complement fixation and a "positive Wassermann" as indicated by 100 per cent or 75 per cent inhibition of hemolysis, that is four-plus or three-plus Wassermann, is not appreciated. There is a difference between positive complement fixation and positive Wassermann as these terms are commonly understood.

As much depends on the way the blood specimen is taken as on the technique of the serologist. This is very important and not generally appreciated. Blood should be taken through a sterile surface, with a syringe and needle chemically clean, dry and sterile. Kolmer has shown experimentally that acid or alkali in dilutions as high as one in ten thousand will cause the reaction to be falsely positive or negative; so, unless the blood is taken with dry, sterile, chemically clean apparatus (needle or syringe) through a sterile surface, the reaction is likely to be influenced falsely one way or the other. Such mistakes are commonly made in obtaining specimens of blood. I have observed sometimes that blood taken with a wet syringe, freshly boiled, will for some reason show a weaker reaction than blood taken from the same patient with a dry, sterile syringe.

So far as the dark field is concerned in relation to the Wassermann reaction, the earlier syphilis is diagnosed and treatment instituted the better is the prognosis. At the same time I believe the interpretation of the dark field examination in the hands of different people is likely to lead to more mistakes than carefully controlled Wassermann reactions. Unfortunately it often happens that, when the patient presents himself for diagnosis, he has tried some kind of treatment on the local sore. Many times before he consults the doctor he has gone to a drugstore and gotten blue ointment, caustic, carbolic acid solution, or some highly advertised "sure cure," and when a smear is obtained no spirochetes are found. It is a common thing for

the Wassermann to be positive in such cases. Dr. Young has sent over three cases recently from the out-patient department which will illustrate that point. The first was a young girl who had a chancre on her tongue which had not been treated. In the dark field examination spirochæta pallida were demonstrated in fairly large numbers. Not long after that he sent over two men who had large, ulcerating, infiltrated sores, each on the shaft of the penis. Both of them admitted that they had treated these sores at least half a dozen times; one had used a white liquid which was probably carbolic; the other had used some kind of white powder. In neither of these cases, although we scraped the ulcers with a scalpel and obtained serum from as great depth as possible, could spirochætes be found. I do not know the exact duration of these chancres, but the patients had not reached the stage of secondary syphilis. Specimens of blood were taken from each and both showed three-plus. So even if the dark field is used it is always well to check the results with Wassermanns.

One point Dr. Young makes I would like to emphasize particularly. Many times lay people even will interpret a negative Wassermann as an indication of the absence of syphilis. Lay people as well as doctors ought to be educated to look upon the Wassermann as a symptom, not as an infallible positive or negative sign. In other words, if they realize that because this symptom is absent, it does not necessarily follow that the disease is absent, they will many times avoid disastrous mistakes. A negative Wassermann does not always mean absence of syphilis, and yet many doctors have had patients leave them and avoid treatment because of a negative Wassermann report. I think these facts ought to be drilled into the laity and some doctors over and over again until the prevailing erroneous impression is overcome. The clinician can do much toward educating the people in this direction.

It is not the time to consider in detail the technique of the Wassermann reaction. When a specimen of blood is submitted to the serologist the clinician should know that complement and amboceptor are tested immediately before the tests are made, that every serum is controlled and that the different factors in the test are controlled. Another thing, the Wassermann is not infallible and no serologist is infallible, and if the Wassermann is three-plus or four-plus which is contrary to the history and clinical findings, it should be checked by another examination. Any competent serologist is glad to do this because he employs a system of checks which makes mistakes practically impossible. We have done more than twenty thousand reactions and have never detected confusion of specimens yet, although the question has been raised several times. It is the fair thing to "lay the cards

on the table" and consult with the serologist and ask him to try again. If the serologist is honest he will appreciate this and try to eliminate error by further checking. Our own reactions are all entered under a number, so we never know in reading them which is which. Sometimes we deliberately divide the serum and put it under two different numbers so we will not know where it is and then see if the different reactions agree.

The following case illustrates some of the points I have endeavored to make clear. A young woman came into the laboratory not long ago. She was a refined looking young woman from L, the mother of three children. She had been in a hospital last summer for six weeks and been given several doses of arsphenamin. Neither she nor her husband were taken into the confidence of the physician, so she was branded as a syphilitic and treated as such, all because she showed one three-plus Wassermann. I do not know whether the serologist who made the Wassermann was guilty of a mistake or not, but I do know that the Wassermanns made six months and a year afterward were both flatly negative. I believe that woman was done a wrong. She, or at least her husband, should have been taken into the confidence of the physician in the beginning; they should have had another Wassermann reaction made as a check to the first one by the same or some other serologist.

When we come to interpret the Wassermann reaction as a check on the treatment of syphilis, a plus-minus or one-plus becomes much more significant. No patient should be considered cured serologically until the spinal fluid as well as the blood has been tested and found negative to the Wassermann reaction. If the blood remains negative over a period of three years, being tested four times the first year, twice the second year, and at the end of the third year, if no signs or symptoms appear in the absence of treatment, if the final tests on blood and spinal fluid are negative, a patient may be considered cured; although, if I had ever had syphilis, I should want a Wassermann done once a year for the remainder of my life.

Cuthbert Thompson: There are two things about this test I would like to refer to. During the primary stage after a syphilitic infection before the appearance of the rash the blood Wassermann is negative; then about the beginning of the eruption the reaction becomes positive, just at the time when the antibodies begin to appear. This proves to us that it is not the spirochætes that give the reaction but the antibodies. If the antibodies give the Wassermann reaction we would expect a positive Wassermann after all the spirochætes are killed for the antibodies remain in the blood for a long time after the disease has completely disappeared.

This causes one to doubt the practice of demanding a negative Wassermann as a proof of the cure of syphilis. I would like to ask an explanation of this as I have seen a number of cases which have received a very efficient course of treatment give a positive Wassermann at the end of it.

Owsley Grant: Dr. Young's paper is a very timely one. The main problem we have confronting us, first of all, is what to do with early cases of suspected lues that do not show a positive Wassermann and that do not show spirochaetes? There is a very definite school who believes in allowing these people to go on to the secondary eruption. How are we going to say whether these people have syphilis or not until they develop the secondary eruption? That is the question. Out of that has grown this school to the effect that no treatment should be instituted until they are sure. A most elaborate paper was read before the Jefferson County Medical Society not long ago in which this question was fully discussed. In cases like that I believe it is important that greater dependence be placed upon the clinical symptoms and the history than upon the Wassermann reaction. I am quite sure if I had a sore that could not be diagnosed, in which no spirochaetes could be found, even if the Wassermann proved negative, if the history was suspicious and the sore looked suspicious, I would certainly want treatment immediately, and for this reason: that there is no question that syphilis can be controlled at least five times as well in the first few weeks of the initial attack than it can during any period afterward.

One point that has not been touched on very much, and I am sure I will get into disagreement with Drs. Young and Graves about this, and that is the provocative Wassermann. I happen to have seen this year a rather unusual number of patients, in comparison with others I see, who presented suggestive history of late syphilis, and by this I do not mean the so-called tertiary syphilis. One of them had a definite macular eruption; two had bone lesions; two others had lesions which looked to me to be syphilitic. One patient is a young girl here in town who has a small reddened place on her leg which had resisted all kinds of treatment. All of these patients had Wassermann reactions made by Dr. Graves, and I have talked with him about the matter several times, and they all came back negative. I gave each of these patients one injection of neoarsphenamin, then took a specimen of blood within twenty-four hours for Wassermann test, and out of the five cases four of them came back three-plus or more. That is another problem, and it is a question whether the "stirring up" of these antibodies produced the positive Wassermann. These patients were

given the usual arsphenamin and mercury treatment and all symptoms have disappeared.

Another thing that I think is important about the Wassermann is the end-results; that is, at what time should we take the Wassermann after treatment? If you have given the patient the ordinary course of arsphenamin and mercury and take the Wassermann within the period of a week or ten days after the first or second course, you are likely to find it negative or very much reduced. I believe it is the consensus of opinion among the best serologists in the country that the Wassermann should not be made until six or eight weeks after the last dose of arsphenamin has been administered in any course of treatment.

One other thing is the matter of neurosyphilis: I believe it has become well established that syphilis of the nervous system is due to a very different strain of spirochaetes than those which attack the blood system and general system of the patient. The blood Wassermann is negative in many syphilis who show nervous manifestations. Those who have reached the stage which we used to call "para-syphilis" almost universally give a negative blood Wassermann. Some of these give a positive spinal fluid Wassermann, but this is rather unusual. I refer particularly to that class of patients with mental derangements and other manifestations of syphilis of the nervous system who give no other clinical signs of the disease. These patients almost universally show a negative Wassermann reaction.

I agree with those who have said that the Wassermann reaction is merely a symptom of syphilis, and that is the real application of the Wassermann test, and a positive Wassermann in this country means syphilis if we can depend absolutely upon the serologists. It is expensive for the patient to have repeated Wassermans made, and for that reason the specimen of blood should be sent to a laboratory that is reliable. Of course it must also be remembered that one negative Wassermann means very little, nor does a positive test as low as one-plus always mean syphilis, because it is susceptible to error; but I believe a four-plus in this country is sufficient proof that the patient has syphilis and treatment should be continued until a negative Wassermann is secured.

As to the proper time to discharge the patient: I believe we can say dogmatically that no man should be dismissed with a positive Wassermann. I have encountered cases where a negative Wassermann could not be obtained by any method of treatment, and my advice has been that medication be continued until a negative Wassermann was secured. In my opinion it is unsafe to discharge such a patient and allow him to marry while the Wassermann is positive.

John W. Moore: I agree with Dr. Graves that one positive Wassermann without symptoms does not mean anything unless you repeat it. On the other hand, a negative Wassermann with symptoms means something. The manner in which the Wassermann reaction is being made at the present time, with three or four different antigens, there is very little chance of error so far as the technique is concerned. However, there are other sources of error. When blood is taken from the patient and placed in a test tube to be sent to the laboratory, that test tube is presumably absolutely clean chemically; but it may not be. When the specimen reaches the laboratory it is put into another test tube which is also presumed to be chemically sterile; but it may not be. That is one phase of the Wassermann reaction which serologists fail to check. This may explain why, in some instances, positive Wassermans are obtained without symptoms and negative with symptoms. Of course physicians should always send blood to the laboratory in tubes they know to be absolutely sterile, and the same statement applies to syringes, needles, etc. I personally prefer never to take blood for a Wassermann with a syringe used in the hospital, for the simple reason we have blood chemistry going on in all the wards and there is always a chance for contamination; although we tell the internes not to take blood with a syringe in the metabolic ward to be sent to the serological laboratory, still they sometimes do it, and under these circumstances you are likely at any time to get a false report; then, of course, the laboratory gets the blame. It has been said that if the patient's blood shows three-plus or four-plus according to the serologist's report, that patient has syphilis. Why not include two-plus also? How do you come to the conclusion that three-plus and four-plus means syphilis when two-plus does not? I recognize that where the reaction shows plus-one or plus-minus there is always some doubt; but I fancy where a patient's serum shows repeatedly a plus-two reaction he has syphilis just as certainly as if the blood shows plus-three or plus-four. Therefore, why say that the patient has syphilis only if his blood Wassermann shows plus-three or plus-four?

Sidney J. Meyers: We can well understand that in laboratory work today, when "everybody is doing Wassermans," mistakes will occur. If we, as internists, must depend upon the laboratory for our diagnosis, you can readily see that we have a great deal to contend with. I would like to speak from the standpoint of our accepting the diagnosis of syphilis as handed to us by the serologist based upon the Wassermann reaction. I have always contended that we are too prone to accept the laboratory diagnosis without considering all the clinical factors in the case. I believe this is a great mistake. To make

myself better understood: I mean that when a patient presents to us, in "ferreting out" the causative factors of disease, we have the Wassermann returned to us positive, and we at once label that patient as a syphilitic. All the symptoms that patient may later present, no matter what or where they are, we are prone to believe they are due to syphilis and we expect to effect a cure by the use of antiluetic treatment. That is a fallacy just as much so as trying to eliminate focal infection. I believe many times when we find a positive Wassermann we are not able to control the condition because we have a syphilitic with some other constitutional diseases, just as we have in other conditions brought about by focal infection. In many cases both in syphilis and other conditions caused by focal infection when the patient comes to us for treatment we are unable to control the progress of the disease because of damage which has already been done; there is so much destruction of tissue, so much pathology in the body, that we cannot expect to give the patient the promised relief. I say this from the standpoint of the clinician, taking it for granted that the Wassermann has been properly made, that the specimen of blood has been carefully taken, we have promised too much to the syphilitic. We know that, especially in doubtful cases, routine Wassermann must be done, and I do not know who said it but he spoke wisely that "if the laboratory findings do not prove the clinical manifestations, the laboratory work must be done over."

J. Garland Sherrill: One point made by Dr. Young in his paper impressed me very forcibly because it recalled to mind the clinical aspects of some of the cases I have seen, i. e., that the presence of a negative blood Wassermann does not always mean that syphilis is absent in the patient. Some years ago I reported an illustrative case before one of the local medical societies and exhibited the patient, a man with an enlarged liver extending downward to the umbilicus, there being a very marked tumor formation, upon whom an operation had been performed a year previously in another city under the diagnosis of carcinoma of the liver. The patient presented to me for examination with that history. The sensation imparted to the examining fingers on palpation and the size of the liver immediately excited the suspicion of syphilis. This, taken in conjunction with the fact that the man had lived for a year after a diagnosis of cancer of the liver had been made at operation, led to the conclusion that a man in the state of health this patient was at the time did not have cancer and made me conclude it was in all likelihood a syphilitic lesion. His blood Wassermann was negative, but I was not satisfied and immediately placed him on antiluetic treatment (this was before the days of arsphen-

min) and the enlarged liver began to subside almost like magic. Improvement was rapid and the man passed from observation before he was entirely well and treatment should have been continued. In investigating the literature of the subject at the time it was found that the percentage of negative Wassermans in syphilis of the liver was rather high compared with similar lesions in other portions of the body.

J. Rowan Morrison: I have thoroughly enjoyed both the paper read by Dr. Young and the discussion. Like Dr. Myers, I believe we should approach the question of the Wassermann reaction in connection with syphilis with mature clinical judgment.

I fully appreciate the work being done by the laboratories and try to use them frequently. While in certain cases they do not lend us very much aid, still we should avail ourselves of all the information which can be obtained in this way before making our diagnosis.

I think Dr. Young is to be commended upon the position he has taken that a positive Wassermann simply represents one of the symptoms of syphilis.

C. W. Dowden: It seems to me the most important feature that has been developed in this discussion and also in the essay read by Dr. Young, is the advice not to accept either a one-plus or a two-plus Wassermann as positive evidence of syphilis without a second check. I believe if the Wassermann is not stronger than two-plus it should be always checked by another test.

Dr. Graves will recall at least two instances in which the patient was so absolutely dumfounded at the presence of a two-plus Wassermann that he insisted that the test be repeated. This was done a week or ten days later and in these two instances both were returned negative on second test. That is sufficient reason to my mind to always warrant checking one-plus or two-plus Wassermann reactions. If it is true that we may get a positive one week and a negative another week, why is it not just as true that we may get a negative the first time and two weeks later get a positive? I believe it is always advisable to have two Wassermans made. This is necessary to prove the value of the Wassermann test.

Another point which has not been mentioned is the great necessity of standardization of the Wassermann reaction. There is no question that various antigens in the hands of different serologists will oftentimes give varying results. I recently had a most interesting experience in a case of this kind. The Wassermann was checked in New York, in Philadelphia, and I believe also in one or two other places, with widely varying results with various antigens. One report showed three-plus, the second was doubt-

ful, and the third plus-minus. Another report was returned one-plus, another two-plus with one antigen and the negative with another, and so on. The patient never had any symptoms of syphilis, he had never been infected as he had never been exposed to infection.

There is still another point along the same line, and that is the Wassermans that are obtained by different individuals which emphasizes the fact that we should always be sure of the serologist. I have seen several cases within the last eighteen months which illustrated this feature. Patients have come to my office with reports of strongly positive Wassermans in whom there was no clinical evidence of syphilis, nor was there any history to indicate that they had ever suffered from the disease. Four patients I have in mind particularly could not believe they had syphilis and insisted upon additional Wassermans being made. In each instance the reaction was flat negative without previous treatment. So it behooves us to know who is doing the serological work. It is quite evident in the four cases I have mentioned that syphilis was not present, but these strongly positive reports were given the patients with instructions to undergo long-continued treatment.

L. Wallace Frank: In cases where the Wassermans are done at different times and the reaction is shown as one-plus or two-plus on the first and negative on the second which is right? I know of a case of brain tumor confirmed at autopsy where the first Wassermann on the spinal fluid was two-plus although the man absolutely denied ever having had syphilis. This positive report caused a delay in diagnosis for more than a month. Thirty days after the first Wassermann, and after a very small dose of arsphenamin but no mercury, another lumbar puncture was made and the Wassermann made on the spinal fluid was flat negative. Both these tests were made by the same serologist. How can you explain that and what interpretation can be made of the Wassermann findings in a case of this kind? It puts the surgeon in a rather difficult position to make the diagnosis.

I agree with what Dr. Young stated in his paper, and which has been emphasized by those who have discussed it, that the clinical aspects of syphilis are of the greatest importance and that the Wassermann reaction is simply an aid to the diagnosis. Furthermore, I believe, and this point was mentioned by Dr. Thompson, that the Wassermann reaction is due to the formation of antibodies, i.e., that it is an antibody reaction. We know that in typhoid fever if the Widal is positive it remains positive long after the patient has recovered from the disease. Therefore, why should not the Wassermann remain positive in a patient who has had syphilis even though he has been treated for a long time and

is clinically well?. In these cases a great many times the patient is "treated for the Wassermann reaction" instead of being treated for the disease. In other words, the Wassermann reaction is being treated and the patient is not.

W. J. Young, closing: I wish to thank the members for their liberal discussion of my paper. I think Dr. Frank has practically answered his own question by referring to the two-plus and negative Wassermann reactions. The matter of diagnosis and treatment of syphilis is one of judgment on part of the clinician rather than the laboratory findings.

In regard to the Wassermann remaining four-plus after treatment: That is a point which I am glad has been mentioned, as it proves my statement that the Wassermann reaction is merely a symptom of syphilis. I would not hesitate to continue the treatment so long as the Wassermann remained four-plus. If the Wassermann remains four-plus after three series of treatments, i.e., six intravenous injections of arsphenamin and fifteen of mercury salicylate extending over a period of eighteen months, I would be impelled to continue treatment rather than to say the patient was well.

I am glad to have Dr. Graves agree with the statements made in my paper, because I have had the privilege of confirming about ten thousand Wassermann reports from him at the Louisville Public Hospital, and his laboratory findings have coincided with the clinical aspects in practically ninety-five per cent of cases. The laboratory and clinical findings have been in perfect accord in one hundred per cent of cases of secondary lues.

In regard to Dr. Grant's remark about positive Wassermann reaction after provocative injection of arsphenamin: I think he has been exceedingly fortunate in getting four positive reactions in the five cases mentioned. The usual provocative Wassermann findings are that about one in fifty proves positive after intravenous injection of arsphenamin. This, of course, refers to syphilitics in the so-called tertiary stage as they are the ones where provocative Wassermans are usually made.

In answer to Dr. Moore: We do not consider either one-plus or two-plus Wassermann as significant of syphilis as three-plus or four-plus. We have demonstrated time and again that the patient may have a two-plus Wassermann without syphilitic manifestations, and in the majority of such cases subsequent Wassermans will be found negative, showing that clinically this slight reaction would not be sufficient to justify the diagnosis of syphilis without other signs.

ABDUCTION TREATMENT IN FRACTURE OF SURGICAL NECK OF FEMUR*

By C. C. GARR, Lexington.

In presenting this subject I first want to offer apology and excuse. I want to offer apology for the reason that there is absolutely nothing original in what I present. It has been more ably presented in the literature for the past twenty years than this small treatise contemplates. Eight or ten years ago Dr. Barnett Owen read a paper on this same subject before this same society and from it my attention was directed to a study of this subject.

I apologize for a repetition—for a presentation of the masterly work of others.

The excuse for writing on this subject is



Figure 1.—Diagrammatic sketch of normal hip: faint lines indicating muscle.

that fractures of the neck of the femur are still being treated by antiquated means—that bad results are still being gotten in a large proportion of cases. In the past few months I have observed patients in the hospitals treated by the old Buck's extension alone—a treatment honored by time but found want-

*Read before the Kentucky Midland Society.

ing. I am one of those who ten years ago believed in Buck's extension with a 15 to 20 pound weight, and to this very day I am one of those who meets the self-same patient treated in such manner on the highways and streets—but with a tinge of remorse and a blush of regret that abduction was not used, for the sight of the crutch, cane and short frail leg remind me that I did not give my patient the opportunity to heal.

The British Fracture Commission in 1913 found from an analysis of 87 fractures of the neck of the femur, that only 23 per cent recovered good function. The figures of the Australian Government investigation of a large number of cases show that 17.8 per cent recovered and 79.7 per cent suffered permanent disability.

It is stated that of 120 cases of un-united fracture of the neck of the femur treated at the Mayo Clinic, not one had had the proper treatment at the time of injury.

A further excuse for bringing this subject to your attention is that while much has been written and said on this abduction treatment, it still is looked upon as a novelty by many.



Figure II.—Fracture of neck showing external rotation and shortening of the leg by muscle contraction

Mayhap this is due to an idea that there is something complex about it, or that a special apparatus for its application is required. There is nothing complex about it, and the apparatus needed can be easily made.

Dr. Royal Whitman, of New York, began

his investigation of this subject in 1897 in which year he reported his observations in the *Annals of Surgery*. In the last issue of the *Journal of Orthopaedic Surgery* he has his most recent article on this same subject—



Figure III.—Position of fragments in abduction after reduction

reiterating that fracture of the femur neck like other fractures must be treated with the principles of mechanics in view.

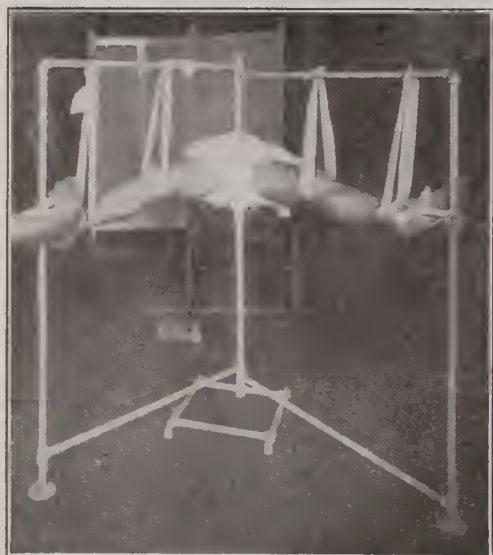
When the neck of the femur is broken—what happens? The head remains in the acetabulum, the great trochanter is pulled upward and rotated outward—the glutei pull it upward and the obturator, piriformis and gamelli and psoas rotate it outward as I have tried to show in this illustration. Whitman has pointed out that it is not from senile changes in bone that faulty union takes place, because the same thing takes place in children and young adults. The reason that faulty union occurs is because of faulty approximation. Faulty union will occur in any fracture of other bones when there is faulty alignment.

The treatment contemplates manual extension and internal rotation, and then abduction to a point of bringing contact between the neck of the femur and the rim of the acetabulum. This position brings the broken surfaces in contact and holds them so and at the same time stretching the capsule so as to get a splinting effect. When this is done all is done that can be done in any fracture.

Now to describe the treatment in more detail: A Hawley table is indeed desirable, but not essential. It makes the work easy, but a gas pipe frame as shown in the illustration

is as efficacious. This frame was designed by one of my associates—Dr. W. O. Bullock. The patient is anesthetized and then placed on the gas pipe frame or on a spica box with a perineal bar. The sound leg is abducted first to determine the limit of abduction. Extension is then made on the injured leg in the line of the body and the leg rotated to the median line. After extension has been made the limb is abducted to the same angle as the well leg with the internal rotation and extension maintained by an assistant all the while. In this position plaster of paris is applied to the well-padded body from the nipple line to and including the foot. The plaster should be reinforced with plaster splints, or steel bars over the hip joint; the point in the plaster most apt to crack.

The plaster is left on eight to twelve weeks and then massage and gentle movement of the



Patient swung on gas pipe frame for application of spica.

joints, hip and knee are instituted. They can then get about in a wheel chair and on crutches. Weight bearing on the injured leg should not be begun under five months in older people and it is usually about one year before the cane or crutch is entirely discarded.

I have called attention to the poor results as recorded in England and Australia. These cases were treated by all the various means of which the literature is so full. Now, let me quote from Dr. Willis C. Campbell, who analyzed in the *Annals of Surgery*, November, 1919, 116 cases treated by abduction. There were 70 new cases—29 of them being central or intra-capsular and of these 29, 24 recovered with bony union and good function—89.2 per cent.

In his series 70 acute fractures and 24 operated on for non-union were treated in abduction with 4 deaths. A percentage of 94.9 per cent of good functional result.

The comparison of results obtained by the method here described and with the results obtained by all other means of treatment is so overwhelmingly in favor of the abduction treatment that I pause to wonder why it is not of universal use.

PERTHES' DISEASE (OSTEOCHONDRI- TIS DEFORMANS JUVENALIS.) REPORT OF CASE WITH PRES- ENTATION OF THE PATIENT*

By ORVILLE R. MILLER, Louisville.

W., colored, age twelve years, school-girl, was admitted to the out-patient department of the Louisville Public Hospital April 20, 1920, complaining of shortening of her right leg. There had been no pain, but she noticed a tired feeling after a long walk. Family and past personal history negative.

Present history: Seven months ago she noticed that her right leg was becoming shorter than the left causing her to limp. There was no pain but she complained of slight stiffness while taking the first few steps after sitting for a while. There was never any swelling, redness nor tenderness in or about the right hip or lower extremity, nor was there a history of an injury of the hip. She stated that the shortening had developed slowly and had steadily increased, the limp in the meantime becoming more marked.

Physical examination negative except for shortening of one and one-quarter inches of right leg with limitation of abduction and rotation. The roentgen-ray showed absorption of neck of the right femur beginning at the epiphyseal line and extending outward producing marked coxa vara. Roentgenologic diagnosis at the time: "Probably traumatic coxa vara." The patient was advised to enter the hospital for treatment but declined.

On August 5, 1920, she consented to enter the hospital where she was placed in bed. There was no further development of symptoms, but the roentgen-ray showed a slight increase in the coxa vara. The patient was studied closely, and on August 13, a plaster spica was applied to the right hip extending from level of the mammary line to the knee. The patient was returned to the ward and was kept in bed for five weeks, after which time

*Read before the Jefferson County Medical Society.

the plaster was removed. The roentgen-ray then showed slight thickening of the neck of the bone and the coxa vara seemed a little more marked. I became convinced that it was not a case of traumatism, and, as was suggested by Dr. Ellars, it was most probably one of Perthes' disease.

In appearance the roentgen-ray plate has always shown more or less resemblance between the head of the femur and a mushroom, the neck appearing rarefied, atrophied and forming the stem of the mushroom. At the same time there has been some slight flattening of the head of the femur.

Conclusions:

In the absence of an injury, or any inflammatory or suppurative process, and with shortening of the neck of the femur, and a coxa vara as a consequence of atrophy at the epiphyseal line which developed slowly and extended over a period of one year gradually growing worse, the case is considered one of osteochondritis, probably Perthes' disease.

DISCUSSION:

R. T. Pirtle: I saw this patient in the ward not long ago. There is more shortening of the limb (one and one-fourth inches) than usually found in Perthes' disease, the coxa vara being about the same. The epiphysis seems to have slipped downward further than is usual and this may account for some of the shortening. Ordinarily in Perthes' disease the shortening is not more than one-fourth to one-half inch.

Cases of this type before advent of the roentgen-ray to check the diagnosis were classified under the heading of tuberculous disease of the hip joint. There is no suppuration and only slight limitation of motion.

By applying a light plaster spica extending from the mammary region to the knee, thus keeping the hip joint at rest, and permitting the patient to walk about on crutches for a few months, recovery is the rule. There may remain some shortening and a slight limp; but in young persons the pelvis soon compensates for this and the limp is hardly noticed.

In Perthes' disease there is rarely any restriction of motion. In this case motion is perfect except limited abduction and rotation as stated by Dr. Miller.

John D. Trawick: I agree with practically everything Dr. Pirtle has said. It seems to me that the essential interest in this case lies in the differential diagnosis between epiphyseal separation, tuberculosis of the hip joint, and Perthes' disease.

In epiphyseal separation there is usually a history of trauma and pain is a prominent feature. Personally I do not know how to account for the absence of pain in epiphyseal separation.

Tuberculous disease of the hip joint is easily

diagnosed. It always begins as an arthritis and the x-ray picture is typical. In Perthes' disease the picture is quite different from tuberculosis of the hip joint.

If there is one and one-fourth inches shortening in this case it is more than ordinarily noted in typical Perthes' disease; in the latter the shortening is not usually more than one-fourth to one-half inch.

As to treatment: Clinically the outlook is, of course, more encouraging than in tuberculous or other types of arthritis involving the hip joint. It will be interesting to hear the further progress of this case.

O. R. Miller, closing: The excessive amount of shortening in this case is evidently due to the coxa vara which has steadily increased even though the patient has been in bed for eight weeks and has worn a plaster spica five weeks of that time.

Perthes' disease is an osteochondritis occurring in young persons and generally involves the hip joint. The cartilage is soft and mushrooming of the bone fibers results, as can be plainly seen by roentgen-ray examination. The neck of the femur is pushed into the cartilage causing it to assume a mushroom appearance.

Before the advent of the roentgen-ray as a diagnostic agent, Henry Ling Taylor, of New York, classified this disease as "tuberculosis of the hip joint without suppuration." In various text book it is called "dry caries," "quiet hip disease," "osteochondritis," etc. The first description of the disease is accredited to Legg, but a few years later Perthes described it more accurately and fully, hence it bears his name.

In tuberculosis with one and one-fourth inch shortening I believe there would be greater destruction of the head of the femur. Tuberculous arthritis begins at the epiphyseal line and extends toward the joints. In this case there has been no extension in either direction.

In epiphyseal separation there is almost without exception the history of an injury with subsequent callus formation, because the epiphysis has the function of forming callus.

As to treatment: Perthes' disease is absolutely self-limited, and the patient usually recovers although nothing may be done except to secure rest in bed. This girl has been at rest in bed and has been given a nutritious diet. No other treatment has been used.

Diagnosis Through Small Particles.—A. Josefson recommends puncture and examination of exudates and scrapings of different structures, tumors and the organs of the abdominal and thoracic cavity. A puncture-syringe with a fine needle is used on liver, spleen and even kidneys; and the puncture-diagnoses have given valuable results.

EXTENSIVE TUBERCULOSIS OF HIP JOINT; CASE REPORT*

By W. BARNETT OWEN, Louisville.

This boy, aged sixteen years, has extensive tuberculous hip joint disease of eight years' duration; he has not walked on the affected limb for that length of time. There is complete destruction of the head and about half the neck of the femur, there merely being a slight film of bone remaining in the deeper portion of the acetabulum as shown by the roentgenogram presented. He has had numerous sinuses which have opened and closed at intervals during the last eight years.

This patient is exhibited principally to illustrate what will happen in tuberculosis of the hip joint unless proper treatment is instituted early in the course of the disease, viz, extreme flexion and rotation causing marked deformity. There may be rotation and abduction, but usually there is adduction with flexion. In this case there is the most extreme flexion I have ever seen, together with bony fusion and consequent ankylosis.

It is very important in treating a case of this kind to make a useful limb if possible. This patient has a "flail-limb" which merely represents "excess baggage;" it has absolutely no function. Examination reveals extensive involvement of the joint with ankylosis.

While this patient has slight rotation outward at the knee he is able to extend the knee completely, which is unusual in hip joint disease of this long duration. Ordinarily there is limited extension at the knee, flexion, sometimes subluxation.

When this boy came under my observation he was very much reduced in general health; he was anemic, emaciated and poorly nourished. We have thought it proper to improve his physical condition as much as possible before undertaking any operative treatment. He has been under the care of Dr. Dunning S. Wilson for four months during which time his health has greatly improved. After he is well enough to withstand the operation, which I regard as quite a serious procedure, we propose to resect the remaining diseased bone, loosen the fused portion above, and gradually extend his limb, using care to prevent too much tension on the femoral artery and vein.

I understand the patient has received no treatment during the eight years he has had hip disease.

DISCUSSION:

R. T. Pirtle: I first saw this boy on the street about a year ago and was impressed with the great deformity and absolute uselessness of the affected limb. I wondered at that time why somebody had not tried to do something for him. Since he has been under the care of Dr. Wilson he has improved wonderfully in general appearance. Therefore, when he comes to operation he will be in better condition to withstand the shock incident to the extensive procedure necessary. Dr. Owen will have to separate the ankylosis and gradually bring the head of the bone downward practically placing it into a new socket; that is, he will have to "ream out" the acetabulum and put the trochanter into this new socket. It may be necessary also to make a subperiosteal separation of the adducted muscles.

A rather strange feature in this case is the wide range of flexion at the knee and extension of the lower leg. Ordinarily in such cases contraction of the biceps tendon makes extension of more than 45 degrees impossible. In this case probably shortening of the femur offsets contraction of the biceps.

After the operation proposed by Dr. Owen this boy will have a short leg, but this can be largely overcome by the use of a thick sole outside or inside the shoe.

O. R. Miller: Ordinarily tuberculosis of the hip joint advanced to the stage shown in this case is attended with considerable involvement of the acetabulum. The roentgenogram does not show this feature distinctly. I would like to ask Dr. Owen to state in closing whether there is not in this case considerable destruction of the head and neck of the bone?

M. Casper: I understand this boy has consulted several physicians in the city—including myself. I saw him only once and made arrangements to operate upon him, but he did not return. Dr. Wilson has been very successful in improving his general condition. At the time he came to me he was anemic, pale and emaciated. His present appearance indicates that he has gained ten or fifteen pounds in weight.

It is surprising how much good can be done by operation in cases of this kind. Not very long ago in a similar case I resected the entire head and neck of the femur and thought the patient would be a great cripple, but from the ease with which he navigates one would hardly know the head and neck of his femur had been resected. He walks without cane or crutch and with very little limp.

It is unfortunate that cases of this kind should be allowed to progress to the stage in which we see this boy without something being done for them. Many of these patients are treated for "rheumatism" for a long while, and this was true in the case Dr. Owen has presented. Roent-

*Clinical report with exhibition of patient before the Jefferson County Medical Society.

genographic examination was not made until the boy came to see me; he had been treated by internal administration of drugs for "rheumatism," sciatica, etc. That is the history of a great many of these cases. The boy upon whom I operated had been bedfast for months. The x-ray quickly reveals the true condition in these cases.

W. B. Owen, closing: The reason I said this boy had received no treatment was because he said he had seen quite a number of physicians, but no opportunity was afforded any of them to be of service to him as their advice was not followed. If his constitutional condition will withstand an operation of the character proposed, which is really a serious and extensive procedure, I believe a fairly good result can be obtained regardless of the extent to which the disease has progressed. He now has several sinuses over the diseased area, and many others have opened and closed at various times. He has mixed infection which is always a result of such sinuses, and the likelihood of further infection also has to be considered. A great amount of shock will most likely attend the operation and this will have to be combatted.

In answer to Dr. Miller's question: The acetabulum is extensively involved, the roentgenogram showing only a slight film of bone remaining, and in the operation we will have to "ream out" more or less of the remaining portion of the acetabulum to make a new socket for the tuberosity of the greater trochanter.

I shall not attempt any orthoplastic work in this case, only hoping to produce a cure of the hip joint disease with the leg in extension, i.e., the position of the greatest function. A limb five or six inches short can be overcome with the type of cork insole extension now being made, and by using an ankle brace a useful limb can be obtained. The patient will be able to walk without a cane or crutch which is the best that can be hoped for.

I realize the seriousness of the procedure which is to be undertaken, and for that reason Dr. Wilson has been co-operating with me in the preliminary treatment of this patient hoping to finally get him in physical condition to successfully withstand the operation.

On April 15, 1920, radical operation was performed on the patient mentioned in the foregoing report under general anesthesia. A curved incision was made over the position of the greater trochanter; the bony fusion from the shaft to the side of the pelvis was separated; the remains of the neck of the femur with the greater trochanter displaced through the wound; about two inches of the shaft with the remaining neck and greater trochanter, which were extensively diseased, were removed. The acetabulum was "reamed out" and the shaft of the femur firmly

placed in the new socket. All the flexors arising from the anterior superior spine were detached subperiosteally, this being done to relieve the extreme flexion. The wound was closed without drainage. A plaster of paris spica was applied and the limb held in the position of ten degrees abduction and extension within twenty degrees of normal range. The boy came off the table in good condition.

Note: November 6, 1920: There is now firm bony ankylosis with the limb in complete extension and 10 degrees abduction. The old sinuses existing prior to the operation continue to discharge. The present treatment is heliotherapy and general constitutional. No brace is being used and none is indicated as there is solid union in good position. The patient has been greatly benefited, and there is a chance of complete cure of the disease with a stiff but useful hip joint.

ELEPHANTIASIS*

By W. H. STROTHER, Owensboro

Elephantiasis is an hypertrophy of the skin and subcutaneous tissues produced by local circulatory disturbances. It not only involves the skin but the underlying tissue and is confined to a member or region of the body.

Symptoms:

The characteristic change of elephantiasis is the enlargement of a region or a member of the body. In more exaggerated forms, particularly as they occur on the extremities, the skin becomes hard and sclerotic, there may be in addition papillary hypertrophy, particularly on the leg and foot, producing warty growth of the tissues; this may be accompanied by marked changes in the epithelium, but there is usually also epithelial overgrowth with the production of roughened, horny, verruca skin, at least fissures, eczema, or even ulcers are very apt to occur. This is particularly the case on the legs, where the inflammatory symptoms are the result in part of the stasis produced by the gravity. The parts most frequently affected by elephantiasis are the legs. I will now give a brief history of a case that I have had recently with a photograph of the case.

The patient a negro, age 45 years, native of Kentucky. Had never lived out of Kentucky. Occupation, a teamster.

Father dead, mother living, 70, health good.

Twenty-five years ago had syphilis for which he received treatment for a short time.

On June, 1917, he had attack of chills and

*Read before the Daviess County Medical Society.

fever, leaving him weak. His feet began to swell and, the following February, that is seven months later, they burst, discharging much serous fluid, after which he was unable to lie down in bed. He was unable to lie down for three years before he died. There was considerable ulceration and a very foul odor that was nearly unbearable.

After having the case under advisement for a few weeks, gave him my opinion that amputation was the only thing to be done, and that did not offer any cure but would relieve the odor, but that in all probability that he would not survive the operation, as he had a valvular heart trouble and the examination of the urine showed a considerable albumen. The operation was done under ether and both legs were amputated above the knee.



The operation lasted forty-five minutes and after being placed in bed he was given salt solution, by Murphy drip. He stood the operation well, all things considered, and progressed well until the eighth day. I changed the dressings and removed the drainage and all went well until that afternoon late they called and said the negro had hemorrhaged through the dressings. I hurried out to the hospital and found the patient in a cold, clammy perspiration and temperature subnormal. On removing the dressings, found that the bleeding had stopped but there was considerable shock. I ordered hypodermic of morphine and atropine with hot water bottles applied. After

about an hour he rallied and pulse was very good. All went well until about 2 A. M., when he had another sinking spell and died in a few minutes.

CO-ORDINATED ENDEAVOR IN MEDICINE MEANS STANDARDIZATION AND EFFICIENCY*

By IRVIN ABELL, Louisville.

It is but a few years, as time goes, since the practice of medicine in this country was strictly a profession carried out according to the ideals and aspirations of the individual members engaged in it. There was no co-ordinated effort to establish a minimum of efficiency as a standard to be attained by those desiring to engage in it, the character of service to patients being left to the honesty, ambition and energy of each individual practitioner. Today minimum requirements, both premedical and medical, must be fulfilled before one may legally enter the field of medicine, a field so broadened by the advance of scientific knowledge that many forces are at work today to standardize and correlate its activities to the end that competent, scientific treatment may be afforded the sick regardless of their financial status.

Standardization does not imply commercialization; this would be as objectionable in the medical profession as in the profession of ministry; but it does imply that all patients, rich and poor, receiving treatment at our hands will be assured of competent and efficient service fully meeting the requirements and standards which knowledge, experience and humanitarianism demand as the unequivocal right of the sick at the hands of those to whom their health and well being are entrusted.

The health of the individual is important to the community in which he lives; the health of the community is of the utmost importance to its development, industrial, social and moral. A broadened conception of the duties and obligations of the doctors to their respective communities does not permit of a multiplicity of standards based on financial and social lines or upon environmental influences; neither does it permit of a lack of standard under the mistaken idea that such as is regarded as minimal is beyond reach, financial or otherwise. It applies the great moral force of man's duty to man, which by its appeal to reason as well as to heart, leads the profession of today to so utilized the mod-

*Read before the Jefferson County Medical Society.

ern addenda to medical and surgical knowledge and to so correlate the work of medical colleges, research institutes, hospitals and clinics, medical societies and public health associations, doctors and nurses that the patient is assured of proper and competent treatment in so far as it is humanly possible to assure it.

The organization of the A. M. A. was the first step in placing the practice of medicine in this country on a basis of efficiency. Through the efforts of this association the medical colleges were standardized, weeding out the inefficient until the total number of such schools has been reduced from 186 to 97. The educational requirements and coincidentally the cost necessary to the fulfillment of such have increased until the number of medical students has decreased from 28,142 to 14,088. The total number of graduates in 1919 was 3,047, a number insufficient to fill available internships, assuring each graduate choice of desirable hospital training.

Such educational advantages are undoubtedly giving to the profession today trained thinkers and workers who must of necessity increase the proficiency of the profession as a whole.

Since the practice of our profession is not an exact science and since brains and intellect cannot be standardized, skill and judgment accruing from ability, application and experience must be the determining factors in the professional fitness one attains. The co-ordinate work of institutes of research, medical colleges and teaching hospitals together with the inspiration derived from medical societies and medical literature offer the doctor of today an ever-open means of increasing his efficiency.

Research work will continue to increase our efficiency in the future as it has done in the past; as it has enabled us to control typhoid, smallpox, yellow fever, malaria, reduce the ravages of tuberculosis and notably lessen the mortality from infection during the recent great war just so surely will further contributions from the laboratory prove an ever increasing help in the fight against disease.

The medical schools and teaching hospitals in their coordinated work have demonstrated the desirability of standardization of all hospitals, that the increased educational advantages of the former be paralleled by an improvement in the facilities of the latter to the end that the public may receive the full benefit of the increase in the standards of medical education and practice. Carefully taken histories, thorough physical examinations, laboratory and radiological studies, writ-

ten diagnoses, records of progress and termination of case with availability of such records for inspection constitute the minimum standard set by the College of Surgeons.

There are over 600 hospitals in the United States and Canada, each with a capacity of 100 beds or more; a compilation and study of the work done and results obtained in these hospitals made possible by the standard just mentioned must result in the addition of much useful knowledge. Medical science is so manifestly incomplete and certain phases and manifestations of disease so little understood that one can not help but feel that the opportunities for medical, surgical and pathological research offered by such study will add much to medical knowledge and thus promote efficiency. Medical societies are important factors in promoting medical development and knowledge, the interchange of ideas, presentation of individual and cumulative experience and free discussion of medical subjects broadens ones horizon and affords a post-graduate school of the highest type. The inspiration derived from personal contact with the leaders of medical opinion, particularly in societies of national scope, proves a great incentive to do better work, consequently more efficient work.

Study of medical literature, wherein is recorded that which is worth while whether derived from the work of individuals, hospitals, research institutes or a compilation of statistics serves to keep one abreast of the times in a field that is kaleidoscopic in character. Cooperation and coordination of the activities of these various bodies as at present being carried out augurs well for the efficiency of the coming generation of doctors.

The ever increasing breadth of the science and art of medicine has led to the development of many specialties, in fact the domain of the general practitioner has been gradually decreased until the internist of today is as much a specialist as the oculist. The increased efficiency of one who concentrates his time and study upon one class of ailments is apparent as is his worth to the community in the treatment of particular ailments and to his fellow practitioners as a consultant whose aid and advice prove invaluable in elucidating obscure symptoms and determining proper therapeutics. Hospitals with closed staffs, the members of which have been selected because of particular fitness in their special line of work, have been organized affording patients the opportunity of combined study and group diagnosis; an opinion or treatment based on such combined examination possesses obvious advantages.

Feeling the handicap of too complete isolation there has been a tendency in recent years for medical men to group themselves according to various working arrangements. The benefits of such a combination are many; not that every patient should be routinely inventoried but because the origin or cause of insidious defects with obscure symptoms require the most exhaustive and oftentimes the most expensive methods of diagnosis. To provide this within reasonable cost group diagnosis is ideal. Like coordinated endeavor in commercial pursuits a large production makes far reasonable cost. It is no hardship to the patient of means to successively visit the experts in their respective lines of work; the poor receive the same service in the public hospital, not as lavish in its distribution but equally as efficient; the patient with modest means, the clerk, the teacher, the salaried class, caught between penny and pride accept inefficient service. Cooperative practice whether in hospital or groups will bring to this latter class real efficiency while permitting a retention of their self-respect and independence.

"These clinical groups must not become diagnostic machines. The patient must not lose his identity and the close relationship between doctor and patient need not be lost. It is not that every patient must be "milled" or that an absolute routine should be instituted. The practice of medicine has not yet arrived at a point where a categorical analysis can displace the intelligent interest of the doctor in whom the patient reposes his confidence."—Tuohy.

Much acute and chronic disease and the multitude of trivial ailments for which patients consult their physician are obvious enough and must be treated by the individual practitioner in the home or hospital, but those who need intensive laboratory and roentgenological study must come to the doctor; this cannot be done at home and the logical place to carry it out is in the clinic or hospital. The formation of private clinical pathological and x-ray laboratories and the establishment of such by the State Boards of Health have made available such service to all who seek it; that the profession is taking advantage of their facilities in greater number yearly is a matter of gratification.

Since the doctor must have means for equipment as well as for the comforts, education and future welfare of his dependents, the doctor of today realizes that the big elements necessary to success are ability and efficiency, that the patient who would buy of his professional wares if you will, demands that they be worthy of his pay.

In conclusion I beg your indulgence for referring to the subject of remuneration for professional service, as it has a direct bearing on efficiency. The altruism of the profession is one of its crowning glories. Through the State Boards of Health and the Public Health Associations the profession, in preventive medicine, is yearly unselfishly destroying a large source of revenue that the health and welfare of the community may be conserved. It has been stated that "one single epidemic of small-pox in a single city will bring more revenue than a quarter of a century of vaccination yet we are the vanguard in insisting upon vaccination in order to stop this procession of death." (Keen). This society through its milk commission has, to its own financial detriment, rendered invaluable service to the community; its members have given unhesitatingly of their service and time to the worthy sick poor, both through membership in the staffs of the eleemosynary institutions and in private practice.

And, yet in the light of conditions that obtain today it must be regarded as a business.

The practice of medicine is a profession as distinguished from a trade; in trades values are determined by measures and quality while the service which conserves health and life cannot be measured by such standards. The facts that the doctor does not consider as capital the money and time spent in securing his education and training, has no definite idea of overhead expense, that his services do not command standardized values, and that his work must so often be altruistic in character have deterred him from developing those qualities which are so essential to success in the business world. All of us have ample proof of this in our daily mail in the shape of solicitations to invest in schemes of such palpable wildcat character as to convince one that we enjoy the unenviable distinction of heading the "sucker list" of the parasites known as promoters. The income tax law forcibly convinces us that the government at least regards us as business men and that we have a definite overhead expense in addition to providing for our families.

Charges should be commensurate with the service rendered and the ability of the patient to pay. The profession itself is responsible for the false valuation of service as measured by office calls and visits, since this standard assumes that all service is of equal value and is to be measured by the time consumed in rendering it. Surely the call to the residence involving nothing more than advice relative to a dietary indiscretion is

not to be measured in value with one at which prompt recognition and treatment prevents an impending catastrophe; the skill and judgment that enables a physician to successfully carry a patient through a severe pneumonia or typhoid should no more be compensated on a basis of visits than should that of a surgeon for removing an appendix.

The economic value of an individual to his family, to his business, to the community and to the state presents wide variations: A readjustment of charges based on such facts, the adoption of scientific methods and treatment, with the organization of same on a systematic, economic basis will make for greater efficiency.

HARRISON NARCOTIC LAW*

By F. M. STITES, Hopkinsville.]

The Harrison Narcotic Law is the interpretation by the United States Government of an agreement between the civilized nations of the world to limit the use and restrict the sale of narcotic drugs.

As was to have been expected the main opposition to this law came from the manufacturers of nostrums and proprietaries containing narcotics, who were enriching themselves in making drug addicts by the thousands every year. Also, some otherwise respectable druggists and physicians, objected at first to this law because it seemed to restrict their personal liberty.

Opposition has now disappeared except among the strictly criminal classes, and the immense benefit of the new law is manifest to every intelligent citizen in this country. However, there are still some druggists and physicians who do not fully understand the scope of the law and who fail to comply with the requirements that are necessary to make the law really effective. It is difficult for an honest doctor to realize that his intention cannot be taken for granted and that his bare word must be backed up by an oath before a notary. Unfortunately, all physicians are not honest, and it is humiliating to see the large number who have wilfully violated the the narcotic regulations which have been issued, and have been convicted in the courts for these crimes. Such rascals in the profession have greatly increased our burdens, and have made it necessary for the officials responsible for the enforcement of this act, to become severe in dealing with all infractions, though mere carelessness or ignorance on the part of the physician has usually been passed

with only the requiring of a promise of more care or the assessing of a small fine. Perhaps the most annoying part of the narcotic law to the busy doctor, is the regulation requiring an accurate record kept of all narcotics dispensed, except those actually administered by the physician himself, while in attendance on a patient away from his office. Administered in the office, even the giving of a single dose must be entered on the record; and outside the office when any narcotic is left by the doctor it is always best that he note the fact so that he will not forget to make the record on returning to the office. The only safe course is to be accurate in keeping the record so that no matter when the inspector calls the amount dispensed will square with the amount on hand. The establishing of a good standing with the Internal Revenue Department is worth all the trouble it takes in keeping an accurate record.

The law is primarily a most salutary statute and it, of course, places a heavy responsibility on the physician. But it compensates for this by providing for every possible emergency in the practice of medicine and the intelligent physician will never be inconvenienced by this statute, neither will the patient ever suffer for lack of the relief needed from a narcotic; if the practitioner and dealer in narcotics will only observe the requirements that are necessary.

The writing of narcotic prescriptions will be less trouble if each physician has his own blanks with his name, address and registry number printed on them. Then it is only necessary to write the patient's name and address and sign the prescription with his, the doctor's, legal signature.

The important point in filling out order forms for the purchase of narcotics, is to see that the stubs are properly filled and kept for the required period of two years before they are destroyed.

The Government does not furnish a book to keep the record of narcotics dispensed by the physician and will accept any legible record kept so that the inspector can without trouble see at a glance the following items regarding the dispensing of such drugs, viz:

Date, name and address of patient, kind and quantity of narcotic and the purpose or disease for which it was dispensed.

Illustration:
1920.

Apr. 21, Lee W., Jr., Hopkinsville, Ky.,
R. R. No. 6, 10 tab. Dover's powd., 2½ gr., aa. (bronchitis.)

This form of record has been recently inspected by the revenue department and ac-

*Read before the Christian County Medical Society.

cepted as satisfying the government requirements.

The time required to make the necessary record, the small amount of trouble in filling the order blanks and the insignificant fee charged to secure the license are not to be considered when we realize the good that comes from the restrictions placed around the dispensing of habit-forming drugs.

There are now before Congress amendments to the Harrison law greatly restricting the importation of narcotics and forbidding their export. These amendments are made necessary by the fact that narcotics are now being exported to Canada in large amounts and smuggled back into this country to those engaged in the unlawful handling of these drugs. Perhaps this is the largest source of illicit supply in the United States.

Large quantities of opium are exported to Japan under existing laws, which get into China and add to the already heavy handicap of this much abused race.

A law forbidding the export of narcotics would aid materially in advancing a race of people whose future holds a remarkable promise for a really great and beneficent civilization.

Our long-standing friendship for the Chinese demands that we give them all the protection possible in their long-continued struggle against opium, that has been forced on them by Christian people, until recently. Japan is doing all in her power to reduce China to a subject nation and is accomplishing this by the most reprehensible means. Increasing the use of opium among the Chinese is hastening the day when Japan can take full possession of the limitless resources of this vast territory. America owes it to herself as well as China to cut off the main source of supply of opium coming from this country. The entire weight of our profession should be placed on the side of these amendments.

A large part of the crime wave that is being exploited by the newspapers is due to the depraved class that traffics in narcotics and alcoholics, and every possible means should be employed to restrain this most undesirable element.

The reputable physician should stand with the leaders of the moral forces of our nation, and no matter the cost, he should always be found on the side of right and helping to lift our race toward the highest ideals both moral and physical.

PULMONARY TUBERCULOSIS*

By J. A. KIRK, Owensboro.

I am sorry to say I have neglected preparing papers on medical subjects and will confess I feel like a real amateur, but in thinking of a subject I know of no other disease that has been so generally discussed and of no other that has not been more nearly mastered by the profession than tuberculosis. Small-pox has been reduced from a most dreaded monster to one of insignificance. Leprosy, Asiatic cholera and yellow fever have become subjects of history. Typhoid fever, malaria and diphtheria are entirely within the hands of medical science. The two old generals of Biblical origin have been wonderfully halted within the last few years, and when we study the present day mortality rate of most all preventable diseases, we are constrained to pause and wonder what really will be left for the doctors of the future to rely upon for employment. But there is yet one faithful friend and standby. The captain of the men of death offers him a challenge that is worth his while. Year after year rolls by with our hundreds of brainy experts and our magnificent institutions of research but the ravages of this awful malady march silently but surely on into the home of the elite and the slave alike. The history of this disease is known to every school boy and girl. Our daily papers have contributed much for the information of the public. Millionaires have given their fortune to assist in its check, but still, we as medical men are confronted with the great question, what can be done to capture this monster that is claiming yearly one hundred and seventy thousand of our citizens and fourteen per cent of our entire number must answer to its call. The pulmonary form is the type that gives us more concern than all of the others, constituting about eighty per cent of all tuberculosis and affects about ninety-five per cent of the entire population. Of this type we have three varieties, incipient, moderately advanced and far advanced, and of these three it is conceded that we, as medical men are only concerned about the incipient. For if our services are to avail anything it is only in this type. The subject of heredity has been abandoned and the modes of conveyance have been practically settled, that it is only from the tuberculosis bacillus which

*Read before the Daviess County Medical Society.

must find an abrasion within the mucous membrane, in the skin, or in other words the protective tissues of the body. For years it was thought that conveyance was only through the atmosphere, from a flying germ that had been cast upon and borne by particles of dust but of later years we have found that food is a large contributor, milk being one of the chief articles of diet. Just recently it was found in New York City that out of five hundred children affected with tuberculosis, twenty-five per cent were of the bovine origin. Some authors believe the reason it was so prevalent in early years is due to the milk drinking age. This subject of bovine origin has been over-ridden along with the drinking cup and many other theories, but we have found that about seven per cent is due to infected milk, which means that if one out of this seven dies, the common ratio, sixteen thousand deaths occur a year from infected milk alone, so why blame our health authority for testing the cows, having milk inspectors, or any other means of protecting babies of our land. How much plainer mode of infection could we ask than to pass the bacillus in impure milk to an inflamed colon or tonsil of a child whose resistance is already below par. The only way the focus of invasion can be determined are through very early recognition. Meats and any articles of diet that is served cooked is of little danger, but candies, raw fruits and toys handled by the child while lounging on a dusty floor that may be literally lined with the germ by careless expectoration go far in the mode of infection.

Kissing should be discouraged. I believe it is generally conceded now that by far the great majority of cases is due to prolonged contact with a tubercular subject and I fear in a majority of instances it is from unsuspected subjects, who for a want of an early diagnosis are allowed to prey upon the public. Just recently a report is handed out from one of our famous men as an instance. In a case of a little girl who died of this disease, the cause was sought and found to be that she was living with two people who to their great astonishment were convinced that it was from them that the child had contracted the disease, not thinking for a minute that they had it themselves. I have said an early diagnosis is paramount. How is this to be brought about? All of our mechanical means of diagnosis have failed so far. The x-ray and microscope are used chiefly to verify a diagnosis already made by some clinician and I believe if we had a law to test our children as well as our cows, twice a year, much could be accomplished through clinical means alone. With

the aid of all of our means, supposing them to be perfect, now what are we to do as practitioners when we find an adult suffering from an undoubted case of tuberculosis, who refuses even to have a sputum test made for fear they might be frightened to learn that they should have the disease. Petit, the great specialist, says not until the day that compulsory report of all cases of tuberculosis be enforced, will much advancement be made in its reduction. I agree with him that far but I contend not until it is within the hands of the physicians to forcibly isolate every case if needs be, will we make much advancement in its management. As to management of the cases that have had the benefit of an early diagnosis, what shall we say. First, what shall be our object? Shall it be to fill this patient with strong antiseptic medicines that are calculated to destroy the germ, or shall we learn from our surgical brethren who at last admit that any drug will destroy a germ will destroy living tissue. Shall we undertake to reach the focus of this disease with a strong medicine that must go through the stomach at the risk of absolutely destroying digestion permanently, or shall we protect this stomach with the hope of overcoming the disease with a better blood that may be built up by pure food and a good digestion? Might we not stop to consider the real cause of our patient being overcome by the disease and to awake to the fact that it was only due to a lowered resistance, caused by improper mode of living, non-nutritious food, or following in the wake of an acute illness that was not entirely overcome by nature and dismissed too soon by a careless physician, instead of restoring him to perfect health before leaving him a prey to any disease that might come his way. Let us remember the lesson of Franks who drank his glass of Asiatic cholera culture each year before his class for four consecutive years, with the view of discrediting the germ theory, but on the fifth year his system being below par, he contracted the disease, which only proved that a run-down condition is more to blame for an infection from any disease, than any other theory. Shall we not give our patients wholesome advice as to their mode of living. Pure water, nutritious food assist digestion, stimulate the entire glandular system by harmless means and above everything, place them within a pure atmosphere and perfect rest which nature has taught us by the adhesions that nature has formed in the affected lung and the shrinking of the diaphragm on the affected side, and above all we have learned from experience that from too much exercise, a tubercular subject will re-inoculate himself.

Lets examine the tonsils, the teeth, give instruction about the throat and as far as we can remember that we are to treat the patient and not the disease.

Above all, at least give him a chance for his life and not put creosote and cod liver oil and other things into his stomach that he could not tolerate even though he were a "Jack Johnson," and in perfect health.

We have a recent report of an investigation of some dozen factories that are engaged in the manufacture of sulphur dioxide and sulphuric acid, employing regularly a combined force of eleven thousand men. For the past 38 years the sum and total of their employees who contracted tuberculosis in all of that time were twenty-two individuals.

I have a case that has been known to be affected with this disease for fifteen years and he selects his own medicine, and all he ever takes, when he discovers a decline in his physical condition, is aromatic sulphuric acid fifteen drops three times a day, after a few days he is much improved and will leave his medicine off. It seems to me if we were the least inclined to try a curative medicine that we would be perfectly safe in using any of the sulphur derivatives, but to my mind we are finally going to reach the conclusion that open air treatment in a suitable atmosphere is our only dependence, and this can only be done by government owned sanitariums, erected in pure atmosphere, which could be done for four hundred dollars a bed, having been demonstrated by the State of Massachusetts. Accommodation could be had for every tubercular subject within the bounds of the United States at trivial cost compared to our expense in winning the world war, which cost us but few more lives in the entire time than are being sacrificed each year by this terrible disease. If our politicians and statesmen and our public press could be aroused with enthusiasm in a war against this disease, and awake to a realization of its devastation as they were during the war, we would have no trouble in establishing sanitariums and enacting laws that would compel every tubercular subject to enter these institutions for treatment, and when society is rid of these tubercular subjects, the greatest step has been made that can ever be made toward the prevention of its further spread by eliminating therefrom, the chief source of infection, the tubercular subject itself.

The Parathyroid Bodies and Bright's Disease.—

H. Bergstrand calls attention to a possible connection between parathyroid hyperplasia and nephritis, evident in ten cases, but was unable to demonstrate it.

WILL DIETING THE MOTHER INFLUENCE THE GROWTH OF THE FOETUS IN UTERO?*

By S. P. OLDHAM, Owensboro.

Many of you have been asked the question is it what I eat that causes my baby to be so large, or is there anything I can do to prevent them from being so? What has been your answer and what shall it be? This question has been asked me time and again—hence the writing of this paper. My opinion is that diet does not influence the growth of the fetus in utero. Prochownik in 1901, first devised a special diet for women with contracted pelvices. In this connection he found that the nutrition of the fetus was modified in a two-fold manner; first, the embryo was enough of a true parasite to obtain nutrition to fulfill all the practical need of health metabolism, growth and vitality; second, the restriction in the mother's diet could manifest itself in the child in such particulars as to lessened accumulation of adipose tissue and slow the rate of precipitation of the earthy matter required for ossification.

Prochownik diet is as follows:

Breakfast, a small cup of black coffee with toast or bread with a little butter.

Luncheon, any kind of meat, fish or eggs with green vegetables, salads and cheese.

Dinner, same as luncheon, with addition of bread and butter.

Absolutely forbidden, water, soup, potatoes, sugar and beer.

Fluids, thirteen or fourteen ounces of wine per day.

This diet in my opinion seems calculated to favor eclampsia or toxemia, owing to its large proportion of nitrogenous food, and small quantities of fluid. Yet, some of the best obstetricians are advocating this diet and others are skeptical or have failed to mention any special diet. Quoting from a number of the best known authors we obtained the following view:

E. P. Davis says a diminution in the mother's food is not always followed by corresponding diminution in the size of the fetus, because the fetus is a parasite and persists in thriving at the expense of the mother.

But Prochownik and others have obtained different results by modifying the diet of the mother. This method of eliminating the size of the fetus is the result of the most thorough investigation which has yet occurred in this subject and is deserving of attention.

Delee states Prochownik hoped to restrain

*Read before the Daviess County Medical Society.

the growth of the child and also retard the ossification of its bones so that it would easily pass through the pelvis.

My few experiences which have been limited have been absolutely negative and indeed daily observation in other cases as for example, tuberculosis, carcinoma, hyperemesis gravidarum, show that the nutrition of the mother has little effect upon the growth of the child which is a parasite.

Edgar says the large proportion of food and small quantities of fluid of this diet undoubtedly favor toxemia. I was confronted with this difficulty in a generally contracted pelvis and in spite of the free exhibition of calomel and colon irrigation. I was compelled to abandon the diet and to induce labor at the thirty-eighth week. Edgar does not recommend this diet.

Hirst feels that an excessive amount of food in pregnancy has its difficulties, quoting the case of the woman who took two quarts of milk daily and gave birth to a baby weighing eleven and two-quarters pounds; after regulating the diet in the next pregnancy a child was born weighing seven and a half pounds. This doesn't prove anything, as the same results have been obtained in patients who had no restrictions in diet.

Reed, in a recent textbook for nurses, says: In contracted pelvis it is sometimes desired to furnish a special diet with the idea of controlling the size of the child, but this is an emergency. Along the better known English authors no mention of diet is made by such men as Eden, Jardine, Johnston, Treedy, Wrench, Wright, and not even in the recently published mid-wifery by ten teachers edited by Berkly.

Still more interesting is the study of books by the German authors; Prochownik being a gynecologist in the well known Eppendorf hospital in Hamburg. No reference to this question can be found in the text-books of such men as Bumm, Olshausen, Runge, Schentau, Zwiefeld. Only Ahlfeld discusses the Prochownik system. He feels the simple reduction in fat of the new-born would be of no practical importance for obstetrician who obviously could be interested only in a diet that could result in a retardation of bone growth and the process of ossification, and agrees with Baumm that the effect of the Prochownik system as a whole is nothing else but a reduction or starvation diet, since it furnishes but two thousand calories per day while the requirement of the average pregnant woman surely amounts to approximately twenty-six hundred calories. Landsburg and Fetzer who have made a pretty thorough investigation along these lines are of the opinion that the fetus takes precedence over the

mother and that it will take from her whatever it requires, and can be prevented from doing it only by a marked deficiency of that particular substance in the maternal organism and in extremely emaciated women in cases of hyperemesis the fat contents of the placenta and fetal liver remain at their normal level. The fetal abstraction of nutritive material from the mother proceeds entirely independent from the nutritive condition of the mother, consequently in studying the opinion in various authors quoted, I believe the growth and development of the fetus in utero is not influenced by any special diet, but are to three etiological factors. First, race and constitution of both parents; second, heredity and the sex of the child and duration of pregnancy. Race plays an important part. For instance, the Scotch people are particularly tall and usually of a robust constitution. Their offsprings are consequently larger in proportion to any other race. The Japanese are small of stature, consequently their offsprings are as a rule small. Who ever heard of a chick from a bantam hen being as large as a chick from a plymouth rock. Heredity is an important factor because of the fact that like begets like and when both parents are of large physique their offspring will be large, and a male fetus is usually larger than a female regardless of diet, and why is it that the fetus of a very stout mother is almost universally small and the fetus of the medium physique or rawbone woman is as a rule large. If diet controls the growth and developments of the fetus in utero, this should be the reverse. If diet is an important factor those suffering from tuberculosis or of any other wasting disease the fetus should be also small and emaciated, which is not the case.

Prenatal Infestation With Parasitic Worms.

—It is among the nematodes that prenatal infestation seems to offer the most important problem. William W. Cort, Baltimore, (Journal A. M. A., Jan. 15, 1921) believes that with further studies it will be found to be not infrequent with hookworm. Other species in which such infestation might occur on account of what we know of the migrations of the larval stages are "*Strongyloides stercoralis*," "*Ascaris lumbricoides*" and possibly the various species of the "*Filaridae*." It seems possible also that the wandering habit of the larvae is a part of the life cycle of "*Trichuris trichinra*" and other human nematodes, which would make possible prenatal infestation in these forms also. The literature on the subject is reviewed briefly.

RADIOTHERAPY IN MALIGNANCY*

By J. PAUL KEITH, Louisville.

There is no longer any question as to the value of radiotherapy in malignancy as the experimental stage has long been passed. It resolves itself into a question of judgment as to the technic in any given case and as to the probable prognosis. In other words, just what can we hope to do for these suffering and pitiable patients.

For convenience of study we divide these into:

1. The pre-operative.
2. The post-operative.
3. The post-operative recurrent.
4. Those treated without operative measures.

According to the belief of the men who have used radiotherapy the most, the effect of the radiation is to destroy malignant cells without injury to the surrounding healthy tissue. It also causes an increased growth of fibrous cells around the malignant nests, and malignant cells after radiation lose their power of reproduction.

Accepting this as true then we believe that every operative case should be thoroughly rayed before operation with two full erythema doses given in at least two series, the last being about four weeks before operative procedure. Careful experimentation has shown that this is the preferable time as complete fibrosis takes place in about nine weeks. All glandular tissue for considerable distance beyond the invaded area should be rayed so as to block all the lymphatic channels so far as possible. Then the operative procedure should be done with the idea of removing all malignant tissue. This is to be followed by a thorough raying as soon after as practicable.

We believe this combined operative and raying would greatly increase the surgeon's percentage of cures and is the best procedure for all operable cases.

Let me here insist that the post-operative radiation be thoroughly done for we know that no one can say in any given cases as to whether metastasis has occurred and it is quite probable that our cures from surgery, especially in carcinoma of the cervix uteri, were the ones where no invasion of glandular tissue had taken place. A great many of those in which the prognosis was good have early recurrences.

The above outlined procedure applies to all malignancies of breast and uteri with probably a few cases of isolated lesions about the

lips. All others are better treated without surgical intervention.

We believe the post-operative treatments should be continued at intervals of from one to three months in the judgment of the radiotherapist to beyond the probable time of expected recurrence (say five years) with the idea that any cells retained might be destroyed, as we know from careful experimentation made by men of great experience that cancer cells are much easier killed when just beginning to proliferate than in the adult stage. The cancer is primarily an embryonal cell.

We present this with the hope of a more complete co-operation between the surgeon and the radiotherapist and believe that by this method we can offer patients the most favorable prognosis, or rather it is giving them everything possible we can to add to their recovery.

The post-operative recurrent cases, of which most of our treatment consists at present, are still in the class of incurables but we know from experience that radiotherapy offers them more than any other form of treatment both as to relief from pain and prolongation of life. The majority of these patients get relief from pain after the second erythema dose and remain free from pain until the end. Many of these patients live several years in comparative comfort and freedom from pain beyond any possible expectancy from any other treatment.

The cases treated primarily by radiation, including skin lesions about the face and exposed parts about the body as well as the comparatively few of breast and uteri which have refused operation or were past the stage where operation offered anything whatsoever, are either completely relieved of all symptoms or relieved beyond all expectations, the patients living comfortably for months and some times for years. The superficial skin lesions are practically all cured by proper radiation.

An increasing number of cures are being made in breast and uterine cases as perfection in our technic increases. A few cases are clinically cured and practically all are relieved of pain. The uterine cases as a rule are relieved of the troublesome hemorrhage and discharge for a considerable period of time if not permanently.

Suffice it to say that enough cases are clinically cured and the majority improved that it behooves us to regard none of them as absolutely hopeless until we have given them the benefit of every known procedure. Of course there is yet much to be learned about the technic for the different forms of malignancy and in the different anatomical locations. However, it seems to be the consensus of opinion

*Read before the Jefferson County Medical Society.

that for malignancy of the cervix and rectum and in certain cases located about the lips, mouth, tongue and tonsils that radium in lethal doses is perhaps the best agent but always to be used in conjunction with x-ray thoroughly given over all glands in the surrounding tissue as the area is usually too extensive to attempt radiation by radium alone.

As we know, the x-ray as used at present with the high spark gap now possible penetrates much deeper than we can expect from radium. By careful experimentation it has been shown that radium only penetrates from two to four c.m. unless an almost impossible amount (on account of the cost of the agent) were used, while on the other hand x-ray penetrates much deeper and is unlimited in quantity, it being only a question of time and sufficient skin area for different ports of entry.

The advantages of radium are that it can be placed in direct contact with malignant tissue in the cervix, vagina, rectum, bladder and oral cavity and with the use of radium needles the malignant cells of localized nodules are brought in direct contact with very little filtration, so the full effect is obtained.

For years there has been a controversy between the radiologist and the surgeon for which a great many patients have suffered, for there is no doubt in the minds of any of us that the cure of malignancy is not to be obtained by surgical procedure alone.

With the proper use of radium and the roentgen-rays, which we believe should be used together in most cases, the attempt of the relief of malignancy by operation will become an unusual procedure. We are also certain this double radiation attack will give a greater number of living patients who are much more comfortable during their existence than has been experienced by those who have submitted to operation.

In the next few years statistics are going to be established that will place radiation in its proper sphere in malignancy and uncomplicated fibroids, for instead of being an ally of surgery it will supplant it in the neoplastic diseases.

We might preach to you for ages on the virtues and advantages of radiation in neoplastic diseases but a paragraph from recent articles by Rudolph Matas and William J. Mayo are convincing evidence of its value.

Matas says: *American Journal of Roentgenology*, Sept., 1920:

"It is, in fact, only now that we surgeons have come to realize that radium has become not only a powerful ally, but an actual rival of surgery, and that radium, when skillfully and judiciously applied, will often yield ex-

traordinary cures where surgery often fails. It is no longer a question whether radium is to be applied, for instance, in inoperable cancer, and only after surgery has failed, but whether it should be given the preference at the start as the initial and only treatment. It is quite natural that at the present time many, if not the majority of surgeons are reluctant to surrender to the new therapy some of their choicest and most dearly conquered possessions—the pure technician and laboratory expert is likely to be too enthusiastic over the potentialities of radium; the surgeon, whose long training and skill have given him confidence in the outcome of his operations, is only too likely to depreciate its real value and to circumscribe its application by too many restrictions."

William J. Mayo, in his presidential address before the Clinical Congress of the American College of Surgeons, October 20, 1919, advocated ante-operative radiation in the following words:

"Radiotherapy has justly achieved a reputation in the post-operative treatment of cancer. It would appear, however, to have its greatest field of usefulness in preparing a malignant area against wound-grafting during operation and its ability at least temporarily to reduce the vitality of the malignant cell. Radiotherapy, whether applied as radium, x-ray or heat sickens malignant cells beyond the area of destruction. During this period of cell-sickness their resistance is reduced and operation is most efficient, but operation should not be delayed after radiotherapy, since the period of increased cell vulnerability is short and the connective tissue development, which interferes with subsequent operation, is rapid. By properly combining radiotherapy with surgery, we can increase operability, lower mortality and increase percentage of cures. Radiotherapy destroys for a certain distance, but cells are sterilized at a greater distance so that their reproduction is checked, and connective tissue is caused to develop which acts as a barrier to the further extension of the malignant process."

Case 1. Referred by Drs. McMurtry and Dugan.

Mrs. "A." Married. Age 42 years. Family history negative for neoplasms. Has two grown sons.

On examination we found a large woman (weight 196 pounds) with loss of 7 or 8 pounds, who presented a tumor in left breast the size of an olive and very sensitive to pressure. She had been taking opiates for relief of pain. There was no glandular involvement in the axilla. She was advised to have the left chest rayed anteriorly, laterally and pos-

teriorly, as is our routine, and then have the breast removed to be followed with post-operative raying, using the same technic.

Much to her surprise as well as her father's, who is a physician, the relief from pain was immediate with gradual regression in the size of the tumor. She was examined by Prof. McMurtry nine months after the beginning of radiotherapy and he stated he was unable to find any evidence of a breast tumor.

A letter from her within the last ten days states she is feeling fine and in excellent health. She has been advised to continue her treatments every four to six months for at least another year as only eighteen months have elapsed since her treatment was instituted.

Case 2:

Miss "N." Age 40 years. Color, white. Housekeeper. Family history: Father living and in good health. Mother died of malignancy of axilla developed from a small nevus. Has two brothers and four sisters living in good health. No history of tuberculosis or lues.

Previous history: Always very healthy, of a robust physique and blond complexion.

Present history: During August, 1919, patient says she experienced severe pains in right arm after having used a sledge hammer in breaking wood. Several days later the right pectoral muscle became swollen, infiltrated and very painful. Says she was treated for pneumonia and after changing physicians two or three times was seen by Dr. C. O. Tydings who referred her to us for opinion as to what she might expect from radiotherapy.

On examination we found a very robust patient. Weight 160 pounds. Stated she had lost 30 pounds during the past two months and had been taking opiates for the relief of pain. A mass the size of an orange was found in the upper half of the mammary gland extending outward into the pectoral muscle with so much induration that it was impossible to determine whether the tumor was in the gland or in the pectoral muscle. The glandular enlargement in the axilla was marked. Edema of the entire arm was present but particularly marked in the hand. The movements of the shoulder and forearm were very much restricted, the last motion causing a great deal of pain.

Her physician and family were told that our belief was she had a sarcoma which it was quite evident was inoperable and that radiation offered her relief of pain for a short time and probably some reduction in the size of the tumor; and with their consent we would use larger doses than was our custom, but no larger than we would want used upon our

mother or wife if they presented the same type of tumor.

Exposure over the anterior portion of the right chest, which included all the tumor mass, gave a skin reaction that was quite severe and early which caused us to reduce the dose on the posterior areas, treated two days later.

Patient received treatment on the following dates: January 15, 17, 29, 31; February 17, 19; March 15, 18; May 3, 5, 24, 26; August 26, 28 and has been advised to see us at regular intervals of three months for the next two years.

The pain was relieved within one week and has not returned. The edema in the hand and arm has completely disappeared and there is no evidence at present of tumor in axilla, muscle or gland. When she returned in March, two months after the beginning of treatment, she insisted she was well and it was only after a great deal of persuasion that she promised to return. She has completely regained her original weight (loss 30 pounds).

Case 3. Referred by Dr. W. E. Gary.

This case is so well described by the patient, from whom we received a letter dated September 10, 1920, that very little can be added so we are interpolating a copy of the letter:

I first began to suffer in June, 1915. I had just passed my forty-seventh birthday, May 30. The pain gradually grew worse and I was advised by physicians to use sediments until September, when I was examined and found to have a small growth in the rectum above the sphincter about the size of a lead pencil and one-half inch long. It was partially removed October 13, by Dr. McGammon, Nashville, Tenn., examination made and pronounced cancer. Then on October 16 he operated removing the rectum above the growth. I remained with him for six weeks and suffered intensely the whole time. He decided that the pain was caused by scar tissue and treated the scars with small x-ray machine. The pain continued. I came home and stayed until December 31, when I returned for another examination. At this time he discovered that the pain was not from the operation but from another growth on the sacrum (right side) about the size of the end of a man's thumb. He kept me eleven days in order to decide what to do. He concluded that another operation was "out of the question" and advised me to go home and take x-ray treatments which he thought would benefit me. I could not get the x-ray here at that time and my pain grew almost unbearable for two months, when I was examined again by another surgeon about March 1, and he said the growth was the size of a lemon. He advised

two operations. First, to remove the rectum to opening in side. Second, to remove growth. I would not submit as I thought he was getting a little rough, so I came home and remained until I went to you for x-ray. I took four treatments on four consecutive days. The next day my pain was equally as bad, but on the second day at 4:30 P. M. the pain began to diminish and by 5:30 P. M. (in one hour) it was all gone and has never returned.

Case 3:

As I had to wait fourteen days before I could take more x-ray I decided to have Dr. Mayo examine me and went to him. I went through the Clinic and the last to examine me was Dr. Will Mayo. He stated the growth was the "size of his fist," that it was already in the glands and advised me not to let another surgeon touch me. He further advised that I take radium (two or three treatments) and keep up the x-ray. That he was satisfied "it would retard the growth, possibly reduce it and maybe cure it." I returned to Louisville and took three more x-ray treatments in April, 1916, then went to Baltimore to Dr. Kelly, and took first radium treatment in April, 1916, two treatments in May, one in July and one the latter part of August. Some time during this time (about the last of May) I took one internally. Total: six radium treatments. In August Dr. Kelly gave me a final examination and stated the growth had diminished until it was about the size of a pigeon's egg. The next treatment was x-ray administered by you at your request and you stated the growth was entirely gone. I feel fine and if there is anything the matter with me I do not know it.

Case 4: Referred by Dr. J. M. Morris and Dr. E. S. Allen.

Mrs. W., aged 70 years, began having some pain in the lower abdomen in September, 1917. November 19, she had a very profuse hemorrhage from the uterus. This was practically continuous to the time the treatments were begun. Early in January, 1918, patient was examined by Dr. Allen and pronounced an inoperable cancer of the uterus, the vaginal walls being invaded with probable adhesion of tumor mass to both bladder and rectum. She was given large doses of roentgen-ray with the hope of relief of pain and hemorrhage. After two full doses relief from pain was secured and after three doses the hemorrhage ceased.

Some time during this year, 1918, she went out of town and did not take treatments for about six months. At this time she had another slight hemorrhage and immediately returned for treatment. She again received complete relief from hemorrhage and pain and

continued so until March of this year, since which time she had had some pain and is at present taking one-fourth grain of eodine twice daily. Three weeks ago she had a considerable hemorrhage lasting for four or five hours. Has had none since. At present she is able to be up and about all the time and has done her own housework ever since six weeks after beginning the treatments.

Case 5: Referred by Dr. E. S. Frey.

Mrs. S., aged 46, married, housewife. Family history negative. None of her ancestors or children have had neoplasms.

On examination we find a very robust woman (165 pounds) with a tumor the size of a small lemon in the upper-outer quadrant of the left breast with distinct glandular enlargement. She stated she first noticed the tumor three months before, the pain appearing only three weeks before. She also stated she had an injury about one month before she noticed the tumor.

After seeing two or three surgeons she accepted our advice of taking radiation with the view of surgery later, but her relief was so complete with disappearance of tumor and enlarged glands she declined surgical intervention. This complete relief continued until

January, 1920, when she received an injury to the breast in an automobile accident and presented herself for examination which revealed a small tumor in the lower-inner quadrant of same breast which has been completely relieved by radiation.

She was seen on September 20, 1920, nearly three years after the first appearance of the tumor and two and one-half years after first radiation. She is perfectly free from any evidence of tumor or enlarged glands and enjoys perfect health so far as she knows.

A tumor of such rapid growth with early glandular involvement accompanied with pain makes the diagnosis as near complete as possible without microscopical examination. We feel there is no doubt of the diagnosis. Both surgeons who saw her concurred in the diagnosis.

It is very interesting to note the incident of trauma as an etiological factor and as the cause of a return in another location in the same breast following a second injury.

The Accomodation Test for Renal Functions.—

V. Scheel applied to a number of cases the following test: 1 liter tea, fasting, then dry diet the rest of the day, during which the variability of the urine was measured, especially the diureses and specific gravity. This method will show the individual variations upon which treatment must be based.

REPORT OF FIVE CASES OF FECAL OBSTRUCTION DUE TO FOREIGN BODIES LODGED IN THE INTESTINAL TRACT*

By A. DAVID WILLMOTH, Louisville.

A casual study of the literature on this subject, or a short stay with a man doing a reasonable amount of abdominal surgery, will induce the opinion that fecal obstruction from any cause is a very serious affection so far as the patient is concerned. No surgeon invades an abdomen for this condition who does not regret the fact that he is called upon in this particular class of cases to give relief. The symptoms not being clear in many instances, causing delay in active intervention, producing a serious condition of the patient, followed by a high mortality, makes this class of work dreaded by all.

It is not the intention of the writer to discuss either the mechanical, physiological or anatomical questions to which much time and careful study have been devoted for many years in the attempt to determine the various causes of the quick dissolution, the extreme high mortality, etc.

For the purpose of study it is well for us to remember that many causes, either singly or working together, may produce slowing or complete stoppage of the fecal stream. Three great classifications may be used to increase our understanding of these conditions:

First: From without by compression.

Through congenital apertures, into normal peritoneal fossæ, through mesenteric slits or diaphragmatic rents. Strangulation by congenital or adventitious bands, diverticula, and peritoneal adhesions. Twisting or torsion of the intestine or its mesentery, volvulus, and intussusception. Neoplasms and wandering viscera.

Second: Obduration.

Fecal impaction, foreign bodies swallowed, cholelithus, enteroliths, parasites, etc.

Third: Structural changes in the walls of the intestines.

Cicatricial contraction as sequelæ of tubercular, typhoid, dysenteric, syphilitic, or malignant ulceration. Cysts and neoplasms growing into the caliber of the intestine.

Since the cases to be reported all come under the second classification, we will not go into details concerning the first and third.

A careful examination to determine what Maylard designates as an "acute abdomen" is the first essential. Second, the careful tak-

ing of the patient's history to elicit the fact that interference with the intestinal stream and not an infection is producing the trouble.

The history taking is very important in all cases, and especially so in these, because it enables the physician to not only determine a fecal obstruction, but aids materially in deciding what is causing the obstruction. To illustrate, the frequency of choleliths in elderly women together with the history, perhaps, of cholecystitis, and where possible confirmed by a radiogram, would determine definitely that one was dealing with an obstruction due to a large calculus which had become lodged in its passage through the lumen of the small intestine.

While such cases are rare, two have been observed by the writer, one in his own practice and one which he had the pleasure of seeing the late Dr. Vance operate upon at the St. Joseph's Infirmary.

Some time ago in a most excellent article by Dr. Martin, of Baltimore, on the subject of intestinal obstruction by choleliths, a careful resume of the entire subject was made, resulting in the study of many hospital statistics and proving the fact that obstruction from that cause is not so uncommon as we were at one time led to believe. His statistics show approximately one in forty-five, which I am sure is much too high; but sufficient cases have occurred from time to time to cause the surgeon to be on the lookout in women fifty years of age or more, as they are the ones furnishing the greatest number of cases.

Strange to say, from rather a superficial review of the literature, I am forced to the conclusion that little has been written about obstruction due to other foreign substances blocking the intestinal stream.

The following cases coming under observation will be here reported, hoping thereby to stimulate further study of this subject and also to sound a note of warning relative to opening the abdomen too quickly in cases where the history would lead one to suspect an obstruction of this character.

Case 1: Male, white, aged 50, was seen by the writer in his earlier experience, with a normal pulse and temperature, but with colicky pains distributed over the entire abdomen and inability to secure the passage of either gas or fecal matter through the intestinal tract. The abdomen was not distended at my first visit, neither was there vomiting. A careful questioning of this man, who was a farmer by occupation, elicited the fact that he had indulged freely in sliced, fried Irish potatoes, of which he was very fond, and had at this particular time eaten in a great hurry

*Read before the Jefferson County Medical Society.

and of course swallowed them in large pieces without mastication.

Since there seemed to be no immediate danger, we began with enemas of various kinds in an effort to induce fecal movement. These were repeated at intervals of two or three hours over a period of 72 hours. At that time the patient began to vomit and I had abandoned all hope of securing evacuation without mechanical interference. Until then no morphine had been given for fear of masking the symptoms, but as I was then convinced that surgery would be necessary and to relieve the discomfort, a hypodermic of morphine was given, so that the patient would be more comfortable and could discuss with us the question of operation.

Under the relaxation of the morphine and the patient's earnest desire to further try enemas, to my great surprise we were at last able to get fecal movements started in which small quantities of potato pieces began to appear. Believing that I was now safe in giving an agent to act from above, I dared to administer a large dose of olive oil. This, assisted by other enemas, succeeded in unloading the entire intestinal tract, and the patient made a complete recovery without the development of peritonitis.

From this case I learned the important lesson of a careful history taking in these cases, and repeated efforts with enemas, which the following cases will prove have been efficacious.

Case 2: Male, white, aged 20, was seen a few months later, and gave the following history: He had indulged freely in grapes, swallowing seeds, hulls and all. The symptoms were practically the same as case No. 1; general abdominal distress, some distension; pulse and temperature normal.

Remembering my first experience with morphine, I administered to this young man a full quarter grain hypodermically and waited for complete relaxation. When this was obtained, enemas were started, with the result that the fifth enema brought away a small mass of grape hulls and seeds. With this encouragement other enemas were used at frequent intervals, and within a few hours the entire intestinal tract was unloaded bringing away a large amount of grape hulls and seeds which had become impacted at some portion of the large intestine.

Case 3: Female, aged 22, was seen, with symptoms as above described, except the local or abdominal condition seemed to be more aggravated and a peritonitis possibly developing. The history in this case showed that a large amount of pop-corn had been hurriedly eaten and swallowed with little mas-

tication. Morphine and enemas, together with time and patience, succeeded after 24 hours in getting some of the pop-corn away, but a week was required to remove all of the dried material from the intestinal tract, for during this time with each evacuation small quantities of the corn would appear.

I was not so fortunate with this case as with the other two, for she had developed and had a severe attack of peritonitis, but finally recovered after a slow convalescence.

Case 4: Female, aged 57, was seen with Dr. Shacklette, of Pleasure Ridge Park. She gave a history of choleliths, and while we did not consider it of enough importance to delay treatment and have an x-ray examination made, the specimen here exhibited demonstrated that a radiogram would have shown us the cause and location of the obstruction before operation.

Her condition warranted surgical intervention for an "acute abdomen," and she was removed to the hospital and hurried to the operating room. An incision in the border of the right rectus muscle allowed access to the entire abdomen, as she was of a slender type. A loop of perfectly empty ileum was caught and by good fortune this happened to be within six or eight inches of the point of obstruction. When this loop was delivered from the abdomen, I at once felt a large globular mass within the intestinal lumen and called attention to this, believing that it was a calculus lodged therein. Before attempting its removal, a hurried examination was made of the upper abdomen by passing the hand under the upper wall, and palpating the gall-bladder. Many adhesions were encountered, tying the small intestine to the gall-bladder and so-called "attie," but a fairly successful examination could be made and several large calculi were felt still present in the gall-bladder.

The age of the patient and her physical condition caused us to determine to leave these calculi undisturbed, and to direct our attention solely to the one causing the trouble. This was removed by an incision through the intestinal wall, which, after the removal of the concretion, was closed by a Czerny-Lembert suture of linen.

This patient made a speedy recovery.

Case 5: Female, 13 years of age, was admitted to the hospital some weeks ago from a neighboring town, with the history that she nearly a week before eaten a large amount of grapes, which she swallowed seeds, hulls and all. She had no distress for 48 hours, and then was treated by the mother for another 24 hours before a physician was called in attendance.

At the time the writer saw this patient, she had been sick five days and had been given by the mother, before the physician saw her, various kinds of pills and potions of purgation. When she was brought to the city, her temperature was 103 degrees F., pulse 130, abdomen greatly distended and very tender, tongue coated and dry, facial expression anxious.

This case seemed to be one that would certainly prove fatal, and I so advised the members of the family who accompanied the patient to the city.

Remembering my former experience, I began the further use of enemas in an effort to secure an alvine evacuation after she had been relaxed by morphine. Twenty-four hours elapsed before results began to show. After the use of a milk and molasses enema, small amounts of grape hulls appeared in the stool. Enemas repeated at as short intervals as conditions would permit, assisted, no doubt, by the amount of material the mother had given the child in an effort to produce fecal movement, soon unloaded the intestinal tract more than a quart. When this was accomplished, I then had left a case of peritonitis which was treated along the general lines with which you are familiar, and am glad to report that this patient also made a complete recovery.

Conclusions:

First: In all cases a careful history should be taken and especially is this true in those of the type under discussion.

Second: Purgation should not be used in any case of fecal obstruction.

Third: Under the use of morphine and repeated enemas in cases where fecal impaction exists favorable results will be obtained.

Fourth: The surgeons should not be in too great a hurry to open the abdomen in cases where impaction from foreign material is suspected. This is in contradistinction to early intervention in the pathological abdomen.

Medical Treatment of Chronic Cholecystitis.—

In Minet's case the woman of 33 had long had disturbances from gallstones, with recurring jaundice and fever so severe that she was clamoring for an operation, when he began to treat her with hexamethylenamin. He gave it by the vein in a series of five daily doses of from 0.5 to 1 gm.; in a second series from 1.25 to 1.75 gm. and in a third series up to 2 gm. The total was thus 21.75 gm. in fifteen days, given in a 0.25 gm. per cubic centimeter solution in distilled water. The clinical cure was then complete, both subjective and objective symptoms having subsided.

SOME PERSONAL OBSERVATIONS IN THE SPREAD AND TREATMENT OF SYPHILIS*

By C. E. HARKEY, Paducah.

As most of you gentlemen know, I have for the past eight months been conducting a Venereal Clinic here for the State Board of Health. I thought perhaps it might be of interest to at least some of you to know in a general way just what is being done in this clinic. The clinic is maintained by the State Board with funds coming from both the State and the National Government. There are 28 of these clinics throughout the State.

The object is to give the indigent ample treatment for gonorrhea and syphilis and to force all people who are afflicted with these diseases to take treatment until they are cured, or at least are no longer carriers. This idea with the proper laws, or ordinances to back it up and officers that will see that the laws are enforced would indeed be a long step towards the eradication of two of the most common, yet the most terrible diseases the human race is heir to. We have asked a number of times that the city commissioners give us an ordinance here in the city copied after the law passed by the Legislature of this State whereby we could throw these patients in quarantine and force them to take treatment. The need for this ordinance is to my mind very vital. For instance, I had a girl to come to the clinic for treatment for gonorrhea and syphilis, both in the acute stage.

She still had the chancre, her throat was sore and her mouth full of mucoous patches. She was living in a house of ill-repute on Monroe street. I began treatment for both diseases at once and cautioned her about continuing to ply her trade. She continued to take treatment until her chancre, sore throat and mouth no longer gave her any pain then she would continue no longer. This case was reported to the Health Officer with the request that she be put in quarantine and held until no longer infectious, but on account of the lack of proper city ordinance nothing was done about this case. The girl continued her trade and from all appearances she must have been doing a good business for I have since treated six men with syphilis who told me they were victims of the blond on Monroe Street, and I might also add that several of these men had gonorrhea also.

I could relate several more cases similar to this one but will not take time to do so.

*Read before the McCracken County Medical Society.

Just so long as there is no one responsible for the control of this class of cases we can hope for nothing in the feeble fight we are making against these diseases and, our blind institutes, insane asylums, and almshouses will continue to be filled with these victims and our courts of justice will remain burdened with divorce cases.

I shall now speak briefly of the work being done in the clinic here. It has been my intention to give not less than four doses and in most cases six of neo-salvarsan intravenously, giving a dose every four to seven days, depending on the symptoms in the case. I also give from six to twelve doses of some form of mercury either intra-muscularly, or intravenously. I have given quite a lot of mercury bichloride one-fourth grain, aqueous solution, intravenously.

While this is very satisfactory to the patient because they do not have the pain and soreness which is to a certain extent unavoidable when put into the muscle. I do not believe I get as good results from this form of medication as from the mercury salicylate given intra-muscularly. The great trouble with mercury salicylate is the extreme pain and soreness which follows the administration of same. For the past two months I have been using mercury salicylate gr., one, in oil with quinine and urea-Hydrochloride one-half per cent. This gives very little pain following the administration and very little soreness afterwards.

My patient first gets a dose of neo-salvarsan either .3 or .6 grams to start with depending on the weight of the patient, if he weighs less than one hundred pounds I give the smaller dose first and the .6 grams at each subsequent dose, if he weighs more than one hundred pounds, I begin with .6 grams and if there is no contra-indications he gets .9 grams each dose thereafter.

I prefer to give mercury along with the salvarsan starting on the third or fourth day following the first dose of salvarsan. My reason for this is based on the action of the two drugs, that is they tell us that the salvarsan does not destroy the *treponema spirocheta pallidum* in the blood to any great extent but only renders them sterile and in this way stops the propagation, then the mercury comes along and murders the gentleman outright.

I use altogether the syringe method in administering the neo-salvarsan giving it usually in 20 c. c. of freshly sterile distilled water. This method saves much time and I believe it practically as safe as the gravity method if your technique is good. I have made up my solution and administered same lots of times in less than ten minutes. I al-

ways have my patient to sit in a chair while taking the medicine unless they are easy to faint, in that case I have them to lie down. I have had a few patients with small veins which were very hard to locate and in some cases I have bungled the job and got a few drops of the solution in the tissues causing a sore arm, but only in one case have I had an abscess and that after being opened healed very promptly.

After giving the patient the treatment as outlined above—provided he stays with me that long for very likely his chancre has healed by the time he gets his third dose of neo-salvarsan, and in many cases he stops treatment at this time—then he is put on a mixed treatment, either in pill or solution, to be continued for six weeks, then he is ordered to rest from all treatment for three months, at the end of which time he is to report for another blood test.

If his blood should prove positive he is given the same course of treatment over again—if he should be fortunate enough to draw negative—he gets only another course of mercury and the mixed treatment, with another rest and at the proper time another blood test, this is to be continued until the patient shows another negative Wassermann for at least twelve months at the end of which time we hope to be able to tell him that perhaps he has been cured. This has not been carried out completely in any case as yet for the clinic was only established last May.

The number of syphilitics treated up to the present time is exactly fifty, twenty-seven of which were males and twenty-three females.

Further divided as follows:

Males: Ten in first stage; six in second stage; eleven in third stage.

Females: Five in first stage; four in second stage; fourteen in third stage.

I have since opening the clinic administered 270 doses of arsphenamine or its equivalent. I administer this drug with 20 c. c. Luer syringe through a 22-gauge one-inch needle. Not many patients complain of the results of neosalvarsan. I have had several people who had sick stomach with vomiting, chill and fever coming on in few hours. After administration, only once have I been called to see a patient suffering from untoward effects of this drug. This was a lady who broke out the following day with a very terrifying rash. It was complete all over the body as much so as any case of measles I ever saw. This lasted about three days and disappeared, but reappeared very promptly after every dose of salvarsan. This, I believe, is known as Herxheimer's reaction.

The chancre I have seen have most all healed very rapidly after getting the patient under treatment. I had one of the serpiginous type that looked very bad, but this patient did not stay with me long enough for me to observe the effects of the medicine. One of the phagedenic type was very troublesome but was healed after about two months' treatment. Rheumatic pains has been the most common complaint of those patients appearing the clinic for treatment, who were well of chancre, in most cases these pains disappear in ten days to two weeks.

I have one patient who was referred to me by another doctor with four-plus Wassermann reaction. His chancre had only been healed a few days, he still had mucus patches and a very bad throat. He was given six doses of neosalvarsan and twelve doses of bichloride mercury intravenously. He was then put on a course of mixed treatment by mouth, and from all appearances was a well man until two weeks ago he came in complaining of eye trouble. He went to a specialist for an examination and was found to be suffering from inflammation of the optic nerve. This was at one time considered to be the late effects of arsenic on the nerve, but has since been proven to the contrary. However, I have not given this patient any more salvarsan and his trouble is clearing up under larger doses of mercury and potash.

We have all read the good news published in our daily papers several times in the last year that Paducah was at last clear of houses of ill-repute, but gentlemen, I have some patients to tell me most every week that he caught his gonorrhea or syphilis from some girl down at so and so's place. Just where he got it I am not able to say, but I can testify to the fact that he has the disease alright. And gentlemen, they take it home and give it to their wives too. I am at present treating three families where both the husband and wife have syphilis.

In conclusion, gentleman, if any of you have patients who are suffering from these diseases and they have not the money to pay for their treatment, you will please direct them to the Clinic.

Intestinal Tuberculosis and Anemia in Consumptives.—Krag-Moller, studying 130 cases, found a casual connection between tuberculosis of the small intestine and anemia, and concludes that this is due to a resorption of hemolytic toxins produced by the tuberculous process in the small intestine. The same affection in the large intestine does not result in anemia because of the diarrhea and consequent reduced resorption of the toxins.

ECONOMY*

By C. V. STARKS, EVARTS.

While sitting in my office this morning waiting for daylight and patients to arrive, thought I would jot down a few pointers on frugality, management, thrift, system, arrangement of economy.

I notice Webster gives as one of his definitions "that economy is the frugal and judicious use of money; that management which expends money to advantage and incurs no waste."

President Harding has set us a great example on economy by the elimination of expenses for the inauguration at Washington on March 4. I think he must have heard the feint cry of the 50,000,000 of naked and starving people in the East pleading with America the God-blessed and richest nation in the world for help. May his tribe increase.

I notice that statistics give that we have been spending around \$3,000,000,000 per year for alcoholic drinks and tobacco and one year since national prohibition it has saved the country \$1,000,000,000; we are spending around \$200,000,000 for chewing gum and the Lord only knows how much is more that is wasted on the Wild West dime novel picture shows and the great part they are playing in causing the great wave of crime that is sweeping our beloved land.

I trust that Congress and all of the legislatures will enact laws at once and substitute in their place educational and religious pictures that will assist our ministers in winning this old world to Christ.

Another great monster evil that is equal to the Chinese opium evil is the tobacco habit that has imbedded its tenacles in at least two-thirds of our population. It is helping to make a nation of weaklings by its deleterious effects upon the vital organs of its victims. Every child has a divine right to be born well but how can it when through the reproductive organs flow the tobacco poison and thru conception the powers of resistance are lessened in the new-born and it cannot resist disease. We, as physicians, see the baneful effects of tobacco every day in our practice, if we will only open our eyes and take notice such as naso-pharyngeal catarrh, heart diseases, and paves the way for tuberculosis. Look at the report of our draft board, our health boards and Red Cross nurses in examination of school children, practically three-fourths of the school children are defective and either their parents or grandparents have been tobacco users. Study your physiologies and

*Read before the Harlan County Medical Society.

read for yourselves the effects. If we can get our great and noble medical profession to awake and cleanse itself and unite with the ministry and church in less than five years we can have written national tobacco prohibition and I hope and pray that I may live to see it a \$5 fine for anyone to be caught using the filthy weed. As the habit allays fear in battle so it allays Godly fear and fear of judgment and thereby causes a lessened attendance at Sunday school and church services. I can safely say and time will bear me out that the tobacco habit is one of the great causes of spiritual decadence in these last days. Let us arise in our might and banish this evil and turn the \$1,000,000,000 that is wasted and burned as incense to the devil each year into the channels for Christianity, education and good roads.

Let us, as good Americans and law abiding citizens lend our aid in prohibition enforcement until it shall be a penalty to be caught with liquor inside six months on a person one year imprisonment, and to be caught making it ten years at hard labor making pikes, and it would not be very long until we would have all the bypaths piked in America.

THE CANCER PROBLEM*

By WOOLFOLK BARROW, Lexington

It is with much hesitancy that I attempt to address you on the question of cancer. Three years ago I had the honor of delivering the oration in surgery before the Kentucky State Medical Association. I chose for my subject "Cancer." Dr. Bloodgood, of Baltimore, one of the leading surgeons of the world after reading my reprint wrote me requesting that I present this subject to the various county societies in the state. I have not had the time nor the opportunity to do this, but I do feel that I or someone else better qualified should present some phases of the cancer problem.

Fundamentally a doctor is a public servant; his duty not only calls for the treatment of the sick but the prevention of disease so far as he is able. It is not my object to try to be original nor too technical. Much of my subject matter is taken from "What We Know About Cancer," a pamphlet prepared by a special committee of the American Society for the Control of Cancer, consisting of Dr. R. B. Greenough, Director Harvard Cancer Commission, Boston, Mass.; Dr. James Ewing, Director of Cancer Research, Memorial Hospital, New York and Dr. J. M. Wain-

wright, Chairman, Cancer Commission, Pennsylvania State Medical Society, Scranton, Pennsylvania. This committee appointed by the National Council of the American Society for the Control of Cancer, was authorized to prepare the pamphlet above referred to as a part of the campaign (inaugurated by the society) for the collection and dissemination of facts in regard to cancer.

The present day physician and surgeon to my way of thinking has no greater duty than the prevention of disease. Unfortunately we are unable to prevent the occurrence of all cancers, but I hope by publicity and education that we may be able to lessen the death rate from this source. Publicity and education are the primary and most necessary steps in the campaign to reduce the very great, and often unnecessary mortality from this disease, for until the patient of his own accord seeks medical advice no steps can be taken toward making a diagnosis or applying the proper treatment. The education must be promoted temperately and wisely, and without producing so great a fear of the disease as to alarm people unnecessarily. It is the knowledge that the disease can be cured by radical treatment in its earliest stages that must be disseminated. Many laymen and some physicians, find it hard to believe this fact. Cancer is not a disease that runs its course like typhoid; it is an actual entity, a part of the individual and remains a part of him and growing to a fatal termination or it must be removed entirely in order that he may be cured. You all hear of many cases that are not cured, whether by operation or not, but you rarely know of the cured cases, for the reason that the individual who has been relieved of the disease by operation attends to his business as before and disguises, so far as possible, the loss of the organ or the scar of the operation.

It is difficult to controvert this personal experience of the individual by assertions of the possibilities or probabilities of cure by operation, but it must be done if the public is to understand the actual facts of the cancer problem. The physician of today is the health officer of his clientele and they look to him for knowledge to protect them from disease. It is a well-known fact that a considerable proportion of malignant tumors are not recognized by the doctor when the patient presents the indefinite early symptoms of the disease. Optimism too often replaces a careful physical examination. The great majority of cancers of the rectum are treated as hemorrhoids for from one to six months. Uterine discharges are often not properly investigated, and curettings are not examined. Can-

*Read before the Women's Club of Central Kentucky.

cer of the mouth or tongue is permitted to advance because there is a positive syphilitic blood test. Malignant moles and skin cancers are imperfectly removed.

STATISTICS

Complete returns of cancer mortality are available only for the registration area of the United States, which, however, includes approximately 70 per cent of the total population. On the basis of this information it is conservatively estimated that the annual mortality from cancer in the entire continental United States is approximately 90,000. According to sex, the mortality by principal organs or parts affected, based on the figures for 1914, is as follows:

TABLE

Organs or parts	Males	Females	Total
Buccal cavity	2,725	570	3,295
Stomach and liver	12,787	15,056	30,843
Peritoneum, intestines,			
Rectum	4,544	6,027	10,571
Female generative			
Organs		11,965	11,965
Female breast		7,771	7,771
Skin	1,982	1,098	3,080
Others	7,838	4,637	12,475
Total	32,876	47,124	80,000

The recorded mortality from cancer in this as in other countries of the world, is gradually on the increase. The annual increase in the cancer death rate is about two and one-half per cent. The recorded cancer death rate has practically doubled during the last forty years.

EXPERIMENTAL WORK

During the past ten years commissions and laboratories for cancer investigations have been established in many places in the United States, as well as abroad. In all of these centers research work has been carried on on the tumors of animals as well as on human cancer. All of the resources of chemistry, physics, physiology and biology, and the study of immunity reactions have been brought to bear upon the problem, and the work is still being carried on; but as yet, the ultimate cause of cancer is unknown. However, many important facts have been discovered. We know that cancer is not due, in the sense that infectious diseases are due, to a parasite. We know that cancer is not communicated from one person to another, and that there is no danger of the nurse contracting the disease in caring for the cancer patient. We know that the influence of heredity in the incidence of the common forms of cancer in human beings is so remote that the factor of inheritance may, as a rule, be disregarded.

We know that many forms of cancer have been brought in relation to some form of chronic irritation, as a direct or indirect predisposing influence, and that cancer of the cervix, the lip, the tongue, the rectum, the stomach and many of the forms of malignant disease of the external skin are all closely associated in their inception with some form of chronic or repeated irritation. It has also been shown in the laboratory that rough compression and manipulation of a tumor are fully capable of setting its cells free to form metastases, and from this we learn to use the utmost gentleness in the palpation of a tumor for diagnosis, as well as to avoid compression, dragging, and all unnecessary trauma to cancer tissue during the operation for its removal.

Certain tendencies are common to all malignant growths. The most important one of course is destruction of the host unless the cancer while local is eradicated. In a talk of this kind it is impossible to discuss cancers of all the various organs of the body. Thousands and thousands of pages are written yearly on this subject. Rather than give a smattering of all these cancers I believe I can better devote my time to a discussion of the most frequent cancers in woman, namely cancer of the breast and cancer of the uterus. However, before discussing the details of cancer it seems to me that in order that you may better understand what I have to say later I should explain something of the anatomical principles of the method of spreading cancer.

Of course I do not propose to go into details, but I believe an explanation of the way by which cancer spreads will be helpful. Cancer spreads directly and indirectly. Directly by extension from one part to an adjacent part; indirectly by means of blood vessels and lymphatics. You will readily understand that all tissues are nourished by the blood supply. Running throughout the body is a network of lymphatic vessels whose function is the distribution and collection of lymph, a fluid which bathes and purifies most of the tissues of the body. These lymph vessels drain into what is known as lymph nodes or glands. They finally drain into the subclavian vein one of the larger veins of the body. As I said above, cancer spreads by direct extension. To illustrate, let us consider cancer of the breast. The cancer begins as a local growth. It grows and presently it reaches the periphery of the breast. Underlying the breast is the fascia or covering of the chest muscles. The growth invades this fascia, then muscle, and so on. This illustrates direct extension. To illustrate indirect extension

suppose the cancer involves a blood vessel. Then suppose a small piece of cancer gets free in this blood vessel. This small piece being free in the blood stream is carried somewhere by it. Suppose it is carried to the liver and lodges there, then we have an indirect extension. The medical term for this is metastasis. The lymph vessels and glands are very prone to be the seat of metastatic growths. In fact this is the usual method of indirect extension.

It seems to me that of all the organs of the body the breast should be the last to be allowed to harbor an inoperable cancer. It is hard to believe that the annual increased mortality rate is greater in cancer of the breast than any other organ. The breast is an organ which the patient can examine, the physician can see, feel and examine in more detail than any other organ of the body and yet the mortality from this source increases yearly. In 1904 cancer accounted for 4.24 per cent of total deaths. In 1913 5.60 per cent. Between 1904 and 1913 cancer of the breast increased 19.67 per cent. Again referring to the chart you will see that there were 7,771 deaths from cancer of the breast in 1914. In preparing my address for the State Medical Society I studied the papers and reference to papers that treated of over 10,600 cases of cancer of the breast. A study of these statistics showed that the average woman carried a tumor in her breast knowing that she had a growth there for 14.3 months before she submitted to operation. Statistics further prove that 50 per cent of all tumors in the breast of a woman over thirty years of age are cancerous; further, that of the 50 per cent that are not cancerous that 16 to 24 per cent later become cancerous. In other words, of every 100 women who have tumors in their breasts 66 to 74 of them have either an actual or a potential cancer.

Some one has said that a cancerous growth as to time before operation may be divided into three stages. The first is the time during which the presence and growth of the tumor do not attract the attention of the host. The second is the time that elapses before the host seeks the advice of a physician. The third is the time the physician consumes in making a diagnosis. The first stage might sometimes be shortened should every woman subject herself to periodic thorough examination. The number in which the growth becomes incurable during this stage is comparatively small. To shorten the second and third stage requires (as I have before mentioned) public education.

The public should be taught that cancer in the beginning is a local disease and is curable by excision. The doctors should be taught to regard all breast tumors malignant until they are scientifically proven non-malignant. The newspapers should be foremost in this education. They would render an invaluable service if instead of advertising cancer cures, etc., they would print facts dealing with the absolute necessity of early excision. The late Dr. Maurice H. Richardson, of Boston, in one of his masterly papers on cancer of the breast said, "Now whatever may be the nature of cancer, its etiology, its treatment, what after all can compare in importance with its early detection? Whether parasitic or not; whether hereditary or not; whether caused by this, that or the other thing, what gives the patient the best, if not the only chance? Is it not early excision? Most assuredly cancer in the beginning is a local condition which is capable of being cured by radical excision. To await cachexia, anemia, and the other classical book symptoms means hopeless inoperability. The more pronounced the clinical diagnosis, the greater the probability of inoperability. The diagnosis of cancer presupposes a knowledge of its etiology, pathology, and symptomatology. As I mentioned before the exact cause of cancer is unknown. Parasitic, infectious, and other theories have been investigated; none has been proven. However, it is generally conceded that cancer is unlike other diseases. It does not represent a general bodily derangement, but a derangement of a limited group of cells which have acquired a charter of liberating them from the inhibiting influence which regulates the growth of normal tissue.

Of the predisposing causes heredity has been proven of not much significance. In 12 per cent of the cases in the statistics that I above referred to there was a history of cancer in the family. Injury was present as a possible predisposing cause in 10 per cent of the cases. Statistics vary from 2 to 22 per cent.

Marriage: No special value statistically because among women of middle age, the married predominate.

Inflammations: Including the involution changes in breasts of aged women present in about 20 per cent.

Age: Cancer before 20 is rare. The youngest case reported was 19, the oldest 91.

Nine per cent occur between the ages of 20 to 30 years.

Twelve per cent occur between the ages of 30 to 40 years.

Twenty-seven per cent occur between the ages of 40 to 50 years.

Twenty-eight per cent occur between the ages of 50 to 60 years.

Twenty-one per cent occurs over the age of 60 years.

We can conclude that cancer is a disease of middle life or old age. 66 per cent passes the menopause.

Pathology: The pathology I believe will not interest you so I shall say nothing about it.

Symptomology: The text book symptoms are given as tumor, pain, retraction of the nipple, glandular involvement, fixation of the skin, and ulcerations.

Primrose in an analysis of 216 cases found that:

- (1.) Tumor present in all cases.
- (2.) Glandular involvement, 29 per cent.
- (3.) Pain present in 24 per cent.
- (4.) Fixation of skin in 25 per cent.
- (5.) Ulceration 9 per cent.
- (6.) Retraction of nipple in 5 per cent.

All of these symptoms and signs excepting the first (tumor) and the second (pain) are those of incurable cancer. To await these symptoms means a hopeless condition.

As to the site of tumor: It is found most often in the upper outer quadrant of the breast. Least often in the lower inner quadrant. In 10 per cent the whole breast is involved. Most statisticians in reference to the extent of growth of the neoplasm divide their cases into three classes. The first class includes those cases in which the growth is confined to the breast tissue. The second class include those with extension of the growth to the skin or muscles with metastasis to the adjacent glands. The third class includes those with supraclavicular metastasis or metastasis to a vital organ. An analysis of the statistics that I have studied show that 63.3 per cent of the cases that come to operation belong to the first class; 28.8 per cent to the second class, and 7.9 per cent to the third class. Most writers consider a case of cancer cured when there is no demonstrable recurrence within three years. Some think five years should be the period. Most recurrences occur within one year. Some in the second; not so many in the third. Even after five years we see recurrence. Accepting three years as the arbitrary standard I find that 72 per cent represent the average percentage of cures in cases of the first class. The percentage as given vary from 34 per cent to 99 per cent. The generally accepted teaching is that 85 per cent to 90 per cent of the cases in class one are cured. In class two about 35 per cent of the operated cases are cured, 25 per cent

being nearer correct. In class three there are no cures.

Practically, what do these statistics mean? First, that in 76 per cent of the cases of cancer of the breast the patient suffers no pain. In other words, over 75 per cent of the patients you examine and in whom there is a cancer of the breast, there is no pain—that in 36 per cent of the cancerous patients you will find glandular metastasis when the patient is first examined. It means that approximately 25 of every 100 cancerous cases are doomed when first seen by a physician. Further, it means that 46 of every 100 women knowingly carry a tumorous breast for one year before they undergo operation. These statistics are appalling. The woman must be taught to fear a breast tumor. They must be taught to consult a physician earlier.

For a few minutes let us consider cancer of the uterus. This is the most common form of cancer in women, as in cancer of the stomach in man. Cancer of the uterus occurs most frequently in women about the time of the menopause or change of life. Many women attribute any change in the type of menstruation to the menopause. It is true that at times a woman may have excessive or abnormal bleeding at this time, but the normal menopause is evidenced by a gradual cessation of the menstruation. A period is missed or the flow is diminished. Any abnormal bleeding such as excessive bleeding or bleeding between periods or the reappearance of hemorrhage after the menopause should be regarded as the danger signal. Any unusual discharge, especially if there is a odor, or if it causes an irritation should be regarded with suspicion. All of these symptoms may be found without cancer being present, but an examination should be made to ascertain this fact. Statistics show that 40 per cent of the cancers of the uterus when first seen by the surgeons are so far advanced that no attempt at radical removal is justifiable. Of the 60 per cent where a radical operation can be attempted approximately one-third of them are permanently cured.

To better illustrate cancer of the uterus allow me to briefly outline the history of a typical case. The patient was 54 years of age, married, and had borne children. Eight years after passing the change of life she noticed a bloody vaginal discharge. The hemorrhage became profuse. The patient was examined for the first time eight weeks after the appearance of the bloody discharge. She stated that she had not been examined sooner because she had no pain and she felt sure that no serious trouble was present because of this lack of pain. The patient felt strong

and had lost no weight. A bloody discharge that appears unaccompanied by pain after cessation of menstruation is almost pathognomic of cancer of the uterus. Statistics prove that great majority of uterine patients have no pain early in the disease—later of course when there is extension and pressure on the nerve tissues pain is usually severe and almost constant. As to the treatment of cancer. The treatment is divided into two general headings, prophylactic and actual. You have already learned that irritation is probably the most frequent forerunner to the development of cancer. The prophylactic treatment consists of the removal by a minor operation, often under local anesthesia of lesions such as persistent scabs, moles, fissures, chronic ulcerations, and indurations, and the benign tumors, which so often precede the development of cancer itself. The most important lesions which may be regarded as of precancerous significance are: pigmented moles; senile scabs; chronic ulcers and fissures of the skin and mucous membranes; gall-stones; ulcers of the stomach; erosions and lacerations of the cervix; cystitis; irritations of the lip from pipe smoking; involution changes of the breasts and benign tumors.

The actual treatment is subdivided into radical and symptomatic. Radical treatment, as the name implies, means a radical removal of the growth by means of surgery or by some agent such as x-ray or radium. X-ray and radium are known to retard and at times destroy certain forms of cancer. Small cancers which are on the surface or situated where they can receive the direct radiation from these agents are the ones that are curable. When the cancer is deep and metastasis is present, a cure cannot be expected. For this reason radium and x-ray are safe methods of treatment only for superficial non-metastasizing types of cancer of the skin or for surface cancers which have not spread internally. Certain gland cancers such as lymphosarcoma are often reduced in size and at times even completely disappear. The surest method of removal as before mentioned is by excision. The symptomatic treatment is only applicable to those cases in which the cancer has so far advanced that an attempt at removal is unjustifiable. The treatment consists of the administration of drugs to relieve pain, or cauterization for sloughing, etc.

In conclusion I would like to again remind you that cancer in the beginning is a local disease and is capable of being cured if excised while local. Early recognition is only possible when the patient consults the physician early. Avoid as far as possible the sources of irritation which predispose to can-

cer. Because of a false modesty or a fear of knowing the truth do not put off an examination should you have any of the symptoms of cancer, for only by early recognition and removal will the high mortality rate from cancer be diminished.

INTESTINAL OBSTRUCTION.*

By J. H. CALDWELL, Newport.

Intestinal obstruction may be classified under several different headings:

Acute and chronic.

Mechanical, dynamic and spastic.

But the writer prefers to consider the subject in this short discussion from an etiological standpoint—namely inflammatory and non-inflammatory.

Inflammatory causes may be; adhesions, appendicitis, post-operative peritonitis, tubercular peritonitis, tubercular enteritis and syphilis.

Non-inflammatory causes may be: volvulus, embolism of mesenteric artery, thrombosis of mesenteric vein, bands, intussusception, gall-stones, diverticulum of colon, Meckel's diverticulum, hernias, internal and external, fecal impaction, malignancy and tumors.

SYMPTOMS

The symptoms in this condition vary, depending upon the place the obstruction occurs and the nature and cause of the obstruction. Four cardinal symptoms are generally present, upon which to base a diagnosis.

First: Pain is practically present at some stage, appears early and is localized in inflammatory cases, while in non-inflammatory cases pain is generally late in appearance and diffuse.

Second: Inability to move the bowels. The contents of the bowel below the obstruction may be emptied and even gas often passes, but this soon ceases in all cases of complete obstruction.

Third: Abdominal distension. This is a natural consequence when obstruction occurs any distance below the stomach, especially in the lower part of the ileum, or in any part of the large bowel, due to decomposition and fermentation of intestinal contents. Pyloric obstruction or obstruction high up in the small bowel often exists without distension on account of vomiting and stool below. Then we usually have retraction of abdomen and emaciation. Distension is not always a marked early symptom but is always present early enough, if obstruction is far below the stomach to be of diagnostic value, if one is alert

*Read before the Campbell-Kenton County Medical Society.

and on the lookout for such symptoms. The great stretching of the gut in distension interferes with the blood supply to all coat of the intestine, and if not relieved soon causes paresis and finally gangrene of the bowel.

Fourth: Vomiting occurs as a rule, early in inflammatory and late in non-inflammatory cases and is prominent in proportion to proximity to the stomach. To wait for stercoraceous vomiting before surgical intervention is a thing of the past. Vomiting is a late symptom in malignancy of colon or rectum.

In inflammatory cases the temperature is elevated and pulse accelerated early as a rule but in non-inflammatory cases temperature and pulse may remain normal 12 to 18 hours or even longer, but in all cases where some of the other symptoms are present but the diagnosis is doubtful, if the pulse gets slightly weaker and is increasing in rapidity there should be immediate exploratory laparotomy performed, if possible before pulse reaches 100 per minute.

Duration of onset is significant in determining whether the case is inflammatory or not, or high or low in the canal. Slow onset (in patients past middle life) covering several days to a month or more, with exacerbations and remissions, with final obstruction, usually means malignancy in large bowel when vomiting is not prominent, and in stomach or upper end of small bowel when vomiting is a marked symptom. Slow or rapid onset should be given great consideration in classification, prognosis and treatment. Rapidly developing cases require early treatment, but slowly developing cases are often in large bowel and more time can be given them.

TREATMENT

First: Mechanical non-surgical—enemas, position and massage.

Second: Medical—cathartics, eserine salicylate and pituitary extract.

Third: Surgical—cutting obstructive bands, hernial rings, anastomoses, colostomy, enterostomy, unwinding of volvulus, and reducing an intussusception.

Mechanical: Enemas two or three in succession, may be used early in all cases without danger to the patient and, in non-inflammatory cases in elderly persons, where there is little or no pain and fecal impaction is suspected, enemas combined with the Trendelenberg position and massage may loosen the impacted feces, but there should be no massage in inflammatory cases.

Cathartics per mouth are mentioned only to be condemned in all cases of acute absolute obstruction, but may be used in chronic partial obstruction or in non-inflammatory cases with slow onset, before the diagnosis can be

made of complete obstruction. In such cases it is often impossible to make a very early diagnosis and if cathartics are used very cautiously, combined with enemas and Trendelenberg or knee-chest position, they may relieve a partial obstruction or confirm the diagnosis of absolute obstruction, without harm to the patient. Most experienced surgeons have seen so many disastrous results, charged to surgery, due to poor judgment in the use of strong cathartics before the surgeon was called, that they generally prohibit the use of cathartics in any case where there is the least suspicion that obstruction is present. Personally, I would suggest that the medical man call the surgeon early in consultation and thus possibly avoid the necessity of operation in some cases, and, where operation is called for, no valuable time will be lost.

If the diagnosis can be made of spastic obstruction, in a given case, morphine and atropine should be used hypodermically.

In dynamic obstruction, one-fiftieth gr. eserine salicylate may be used hypodermically every three hours until three or four doses are given, which sometimes causes contraction of the muscular coat of the bowel. But a much more efficient remedy in this condition, is pituitary extract, given hypodermically in 1 c.c. doses which may be repeated every two hours until three or four doses have been given, followed by enemas 20 to 30 minutes after each dose. Without claiming any credit for original discovery, the writer claims to be among the first surgeons in Cincinnati, to use pituitary extract for dynamic or threatened dynamic obstruction of the bowels. This was several years ago during the experimental stage of pituitary extract, shortly after its action upon the involuntary muscle fibers of the uterus had been proven and it was just beginning to be used in obstetrics. The writer reasoned that if it caused contractions of involuntary muscle fibers in one organ that it should have the same action upon involuntary muscle in other organs, and gave the first dose with satisfactory results. Pituitary extract is a very powerful remedy and much has been written in medical literature about it in the last few years, hence its uses and action are well known to the medical profession.

Surgical: Surgical treatment as a rule, is the only life-saving measure for all cases of complete intestinal obstruction, and the writer knows of but few other circumstances that so thoroughly test the surgeon's ability for good technique, speed, accuracy of judgment in operating and also good judgment in post-operative treatment, are absolutely essential, to accomplish good results.

Time will not permit a description of the technique of all the various operations that may be of benefit, as the writer believes that any surgeon who opens an abdomen for intestinal obstruction should be able to perform any operation that circumstances call for. As the late Dr. P. S. Connor said, "Open the abdomen and be governed by circumstances."

One point in technique used by Dr. W. J. Mayo, that will facilitate other procedures that are generally necessary in cases where the intestine is greatly distended, is the use of the old-fashioned ovariectomy trocar, thrust into the lumen of the intestine through an opening made by a knife or scissors. By gathering the folds of the intestine upon this instrument eight or ten feet of bowel can be emptied. With the intestines comparatively free of contents, one can take care of trouble, which would be fatal to attempt, were the abdomen distended.

The following cases represent some of the various types of obstruction:

Case 1. Miss K. G., constipation for three months which gradually grew worse until there was absolute obstruction, with diffuse pain in abdomen and distension without rigidity. Pulse and temperature normal. Operated March 1, 1911. Appendix removed which was found to be only a fibrous cord adhered over cecum, causing a sharp kink in bowel and complete obstruction. Patient made uneventful recovery.

Case 2. K. C., boy, aged 15, referred by Dr. Brown, of Foster, Bracken county, Kentucky. Patient had acute appendicitis and refused operation three weeks before I saw him. He recovered and one week later had pain in left iliac fossa and swelling that upon palpation resembled a large sausage. Temperature and pulse normal. Abdomen distended and tympanitic except over tumor mass and hypogastri region. Complete obstruction. Enemas were used without results. Operated May 30, 1913. We found long appendix with distal end perforated and adhered deep in pelvis with exceedingly foul smelling abscess containing one quart of pus that extended up into left iliac fossa. Patient made uneventful recovery.

Case 3. Mrs. K., age 59, referred by Dr. J. A. Caldwell, had had what she called stomach trouble for five or six years. She was very much emaciated and complained of pain in stomach. Would take food for two or three days then vomit great quantities of decomposed material. Diagnosis, pyloric obstruction which was confirmed by x-ray. Patient also had ataract in left eye, complete prolapse of uterus, albumen and casts in urine, stones in right kidney and at autopsy eight

months after operation, it was discovered that she had carcinoma of left kidney. Operated December 11, 1912. Posterior gastro-enterostomy was performed, patient recovered and left hospital three weeks after operation. She lived eight months, gaining 25 pounds in weight, eating all sorts of food which she enjoyed and was very comfortable. She died eight months later of uremia.

Case 4. Mr. J. J., age 43, referred by Dr. O. W. Brown. Operated May 28, 1915. Had dynamic obstruction due to perforated duodenal ulcer and general peritonitis. Ulcer was closed and abdomen drained. Enema was given three days after operation and eight days after a calomel and saline purge with good results. Patient recovered and left hospital four weeks after operation.

Case 5. Mrs. A. W. T., age 55, referred by Dr. E. A. Cram, of Pendleton county, Ky. Operated July 31, 1915, for strangulated femoral hernia causing obstruction of bowel. Patient made uneventful recovery and remained well.

Case 6. Mrs. P. G., age 48, referred by Dr. J. E. Pinguely, of Melbourne, Ky. Patient had a large goiter, heart action somewhat accelerated but no tremor present. Mother of nine children, had always had good health, bowels moved regularly until three months previous, when she became constipated and grew worse until there was complete obstruction at sigmoid flexure, but there was never any blood in stool. Upon operation resection of carcinoma of lower end of sigmoid and end to end anastomosis was done November 11, 1917. Patient did well and bowels moved several times three days after operation, but died on the seventh day, apparently from weakened myocardium.

Case 7. E. V., age 6, referred by Dr. J. E. Pinguely. Was rather delicate child, very precocious. Trouble began with swelling and pain in joints, swelling under eyes and muscles of left chest. Bowels and kidneys acted well urinalyses normal, temperature 101, pulse 102. Four days later all swelling had disappeared but abdomen was distended and upon percussion flatness of whole right side, and of left side up to umbilicus, was present. Temperature 102.5, pulse 176. Upon opening the abdomen a large quantity of straw-colored fluid and an intussusception of the ilium which was gangrenous, was found. Resection of eighteen inches of small bowel and an anastomosis with a Murphy button was done. Patient died twelve hours after operation.

Case 8. Miss J. K., referred by Dr. J. A. Caldwell. Always strong and healthy, had had an ovarian cyst with twisted pedicle removed by another surgeon about one year

previons with prompt recovery. A short time after operation was very ill for three weeks with influenza, but made complete recovery. January 24, 1920, had diffuse pain over abdomen and vomited shortly after a very heavy meal, which gave her some relief. Temperature and pulse normal, bowels moved fairly well every day for four days, but there was some pain in region of appendix and slight distension of upper abdomen. On fourth day temperature 99.5, pulse 90. Upon opening the abdomen some straw-colored fluid was present and the upper half of jejunum greatly distended and with many dark ecchymotic spots on it. Peritoneum and muscular wall very fragile over this region where two or three small perforations occurred while we were searching for cause of obstruction. This was found to be a thick band of omentum adhered over the small bowel about eight to ten feet from the stomach. This band was cut through releasing the obstruction, and abdomen drained. A fistula occurred one week after operation but soon healed. Patient left hospital five weeks after operation.

Case 9. M. V., age 56, referred by Dr. W. B. Hughes. Patient had been suffering with symptoms of gastric ulcer at times for two or three years. About five months previous to operation began to have obstructive symptoms, vomiting all food, but refused operation until Feb. 24, 1920, when she had become reduced from her normal weight of 200 pounds to 100 pounds, and was very weak. Patient was now convinced that she could not recover with medical treatment and asked for operation. Upon opening the abdomen, carcinoma, involving posterior wall and lesser curvature of stomach, was found, which was adhered to under surface of liver. The lesser peritoneal cavity was opened below stomach and upon placing two fingers behind stomach to palpate mass, stomach contents were discovered flowing out from behind the stomach. Perforation was found through the center of the growth that could not be closed, hence it was necessary to dissect it loose from the liver and do a sub-total gastrectomy and remove first portion of duodenum. Anastomosis between fundus of stomach and jejunum with Murphy button was done.

Diagnosis of Cancer from Tumor Cells in Exudates of Serous Cavities.—U. Quensel stains the sediment with his methylene blue and sudan preparation (also used for urine). It may then be possible to distinguish both endothelial and tumor cells. The latter are larger, with vacuoles, and a relatively large nucleus; the whole taking the stain deeper than the other cells.

THE SIGNS AND SYMPTOMS OF RENAL TUBERCULOSIS; A REVIEW OF 125 REPORTED CASES*

By W. T. BRIGGS, Lexington

The decision to make this study came from my own interest in the subject, as well as three well-founded convictions, namely:

1. Renal tuberculosis is often not correctly diagnosed until it has been present for some time.
2. Because of the frequently present vesical irritability, painful and useless irrigations and instrumentations are often practiced without benefit, if not positive injury to the patient.
3. More physicians and surgeons think tuberculosis is an uncommon lesion of the kidney.

That is is a common rather than unusual surgical lesion of the kidney the following figures taken for the most part from the reports of St. Mary's Hospital, Rochester, Minn., for the years 1914, 1918, inclusive prove. During these five years there were 1,418 kidney operations in that hospital. Three hundred and twenty-two (322) were nephrectomies for renal tuberculosis, 333 were nephro, or pelvicothotomies or nephrectomies for calculus, 354 were nephrectomies for pyonephrosis either with or without stones. In other words, 1,009 or 71 per cent of the 1,418 kidney operations were for pyonephrosis, calculus or tuberculosis. That this average incidence is not exceptional it may be added that in Kronlein's experience 29.8 per cent of all renal surgical lesions are tuberculous while Israel's figures show that 33 per cent of all purulent processes in the kidney are of tuberculous origin. Von Schmeiden's classical paper which included all published reports of nephrectomies through the year 1902—1,118 cases—showed that 18 per cent were for tuberculosis. It is rather interesting to note that 329 of these 1,118 reported nephrectomies were for neoplasm whereas less than 75 of the 1,418 operations at Rochester were for neoplasm. In other words before 1902 most diagnoses were based on the gross analysis and physical findings rather than on cystoscopy, bilateral catheterization of the ureters, roentgenography, etc.

With only the few figures above in mind, none of us should ever fail to think of tuberculosis of the kidney whenever there are any urinary symptoms. And as a matter of fact we should consider the possibility of this le-

*Read before the Fayette County Medical Society.

sion even in the absence of renal and vesical symptoms if the patient suffers from a loss of weight and strength which is not readily explainable, since a small proportion of these cases present no other symptom. It is only by taking this stand that we can hope to diagnose this disease before the second kidney is involved or the health totally undermined.

Unfortunately for the sufferers we could not promise 100 per cent or even 75 per cent of cures, not matter how early the diagnosis. However, the percentage of perfect recoveries is better than in malignant tumors†—and tuberculosis in this organ is essentially a malignant lesion even though it is not a neoplasm. Medical treatment offers little more in renal tuberculosis than it offers in malignancy. It is true that many of the patients live longer than do those suffering with cancer but the life is one of suffering and often-times longing for a death which apparently approaches by inches. Doubtless cures occasionally take place without operation but so seldom that it is a gross error to count on such a result. Post-mortem and operative specimens of tuberculous kidneys have time and again demonstrated the uselessness of tuberculin as a curative treatment. Fresh air, tonics, rest and other antituberculous measures are of far more value if employed after nephrectomy than before.

In this compilation I have adhered strictly to data given in the original reports. Some of the reports were very meagre but if they contained anything useful to this study they were adopted. This will account for the fact that certain signs and symptoms were studied in fewer cases than the total number, e.g., 125. For the sake of brevity after each caption the number of cases included will be added.

Sex: 123, females 67, males 56.

Cabot and Crabtree found females affected in 36 of 70 cases. Israel's statistics show that of 43 cases 29 occurred in women and he quotes Fachlam's statistics which show that there were 73 cases among women to 30 in men. These figures added show that of 339 cases 191 or 56 per cent were in women. Contrary to this, however, Braasch found that it occurred oftener in men, e. g., 63.5 per cent of 523 cases were in men.

Age: 118 cases divided as follows:

1 to 10	3 cases.
11 to 20	13 cases.
21 to 30	46 cases.*
31 to 40	37 cases.*
41 to 50	18 cases.

51 to 60	2 cases.
61 to 70	1 case.
*83 or 70 per cent.	
Youngest aet., 9.	
Oldest aet., 64.	
Average aet., 32.	

Other statistics:

	Youngest	Oldest	Av. Age	Incidence bet. 21-40
Cabot & Crabtree	14	65	34 to 39	58%
Cabot & Crabtree	14	65	34 to 39	58%
Israel	8	63	32 plus	66%
Braasch	not stated	61 plus	Not stated	69%

The average incidence during third and fourth decades is 65 per cent. This fact is worth remembering, especially when hematuria and tumor are prominent symptoms since tumor of the kidney occurs oftener during the first decade or after the fourth.

Hydronephrosis, calculus and pyonephrosis are all most often discovered during the third and fourth decades of life. In hydronephrosis hematuria is exceptional and aside from the polyuria following an attack, urinary symptoms are rareties. A carefully taken history and thorough physical examination will lead to a diagnosis in most of these cases; in the remainder, ureteral catheterization and pyelograms will usually settle the question. Unfortunately many of these cases have abdominal operations before the cystoscope is used.

Radiograms will usually eliminate calculus but the x-ray is not infallible and must often be supplemented with pyeloureterograms and the waxed-tipped catheter. Probably pyonephrosis is harder to differentiate from certain forms of tuberculosis than any other renal condition. Fortunately exact diagnosis between tuberculous and non-tuberculous pyonephrosis is not so important since the diseased kidney should be removed in either case, provided the function of the second kidney is satisfactory.

Family or Association Tuberculosis: 28.

Was mentioned but seldom. In eight cases either there was a tuberculous family history or the patient was closely associated with someone known to be tuberculous. In twenty cases there was no known family or association tuberculosis. Since tuberculosis is contracted so often outside the family a thorough history regarding the family tendency would help but little in making a diagnosis.

Coincident Tuberculosis of other Organs: 28.

Found in only 28, or 22 per cent of 125

† Braasch, of the Mayo Clinic, states that 60 per cent. of the 364 cases thoroughly investigated obtain perfect cures.

cases: Divided according to organ involved as follows:

Lung alone	17 cases.
Lung and epididymis	2 cases
Lung, epididymis & joints	1 case
Lung & prostate	1 case
Hip	1 case
Hip & epididymis	2 cases
Spine	1 case
Epididymis	2 cases
Prostate	1 case

Braasch says evidence of tuberculosis in other tissues of the body may be found in fully 71 per cent of patients. However, one must not expect to find such a large percentage unless the chest is systematically radiographed in all cases of tuberculous kidney. Radiograms of the chest often show healed lesions which could not possibly be diagnosed by physical examination. In the presence of active pulmonary lesions operation should be delayed if possible.

General Condition of the Patient: 36 cases.

Specifically stated in only 36 cases as follows:

Poor	14
Fair	10
Robust	12

However, 44 of the 125 cases had lost weight, 26 had fever, 15 had chills and fever, and 10 had night sweats. In other words 95, or 76 per cent of the cases had some constitutional evidence of disease.

Urinalysis and Vesical Symptoms: 125.

Pyuria, pollakiuria, hematuria, dysuria ..	27
Pyuria, pollakiuria, dysuria	20
Pyuria and pollakiuria	16
Pyuria alone	12
Pyuria and hematuria	8
Pyuria, pollakiuria and hematuria	7
Pyuria, hematuria, dysuria	1
	90

Pyuria alone or associated with some other urinary change or vesical symptom was present in 72 per cent of the cases. If we except pyelonephritis and pyonephrosis there is no other renal condition in which pyuria is so constant. Hence the necessity of suspecting renal tuberculosis whenever the urine contains pus, especially if by treatments or cystoscopy we can exclude the bladder as the source of the pus, and radiograms are negative for renal or ureteral stone.

Hematuria, pollakiuria, dysuria	5
Hematuria and pollakiuria	4
Hematuria alone	3
Hematuria and dysuria	2
	14

In 37 cases the hematuria was microscopic. In four cases it was "massive."

Pollakiuria and dysuria	4
Pollakiuria alone	3
	7
Urine normal	3

No mention of characteristics of urine or vesical symptoms in 11 cases.

In two cases there was incontinence.

In one case retention.

The above figures are rather significant. If we omit the eleven cases in which no mention of the urinalyses and vesical symptoms was made we find that pyuria or hematuria or both were present in 104 of 114 cases or 91 per cent, and in all except 15 cases there was some vesical symptom, such as frequent and painful urination. The presence of pyuria alone, or in combination with hematuria and vesical symptoms usually means cystitis from some cause, or some infectious process in the kidney. Since in my experience the ordinary "idiopathic" cystitis such as occurs oftener in women is usually cured in four or five treatments I make it a rule to cystoscope patients after several treatments unless the condition rapidly improves. It is hardly necessary to state that the progress of cases under treatment is checked up by stained smears of the urinary sediment from day to day. If the pus and bacteria do not diminish from day to day it is hardly fair to the patient to continue irrigating the bladder even though the vesical symptoms are improved. Where there is pus without any bacteria cystoscopy is suggested at once, because of the possibility of renal tuberculosis. Urinary sediments are stained with carbolfuchsin and methylene blue since this shows acid fast as well as other bacteria.

Nothing is lost by adhering to this rule since an infected bladder resisting treatment should be inspected and the ureters catheterized to exclude a renal source of infection unless stone, foreign body, tumor, diverticulum, or obstructive changes in the urethra or at the vesical neck readily account for the infection.

Radiography should be employed in practically all cases as soon as the bladder has been excluded as the source of trouble. Radiography is not only our most reliable means of diagnosing stone but it will show more or less typical shadows in 15 to 20 per cent of cases of renal tuberculosis and will also often-times show up a pyonephrotic kidney.

Bilateral functional tests, when the radiograms are negative for stone are of great service in differentiating a pyelitis from the more serious conditions such as pyonephrosis

and renal tuberculosis. Whenever phthalein intravenously is used in the bilateral test it is a wise procedure to make the urea test also since it is an excellent check on the accuracy of the red test, especially when there is much leakage into the bladder around one or both of the catheters.

Pain: 115.

Lumbar or renal	50
Ureteral	12
Distinct renal colic	4
	66
	or 52 %
Vesical	17
In penis or urethral	10
Serotal, vulval or testicular ..	5
In thigh	2
Inguinal	4
Iliac	4
Rectal	1
In shoulder	1
Abdominal	2
Subcostal	1
In perineum	1
Appendiceal	1

In only 52 per cent of the cases was the pain directly referred to the kidney or ureter. If we compare this percentage to the large percentage in which the symptoms point to the bladder it at once becomes clear why renal tuberculosis should be suspected whenever there are bladder symptoms.

Tenderness or Tumors 125.

Lumbar or renal tenderness was present in 29 cases, hypogastric tenderness in 5. A tumor or mass could be felt in 45 cases. Here again it is noteworthy that in many cases the kidney though diseased, suffers in silence.

It is hardly necessary at the present time, when practically all surgeons rely on ureteral catheterizations before operation, to warn against the mistake of confusing a perfectly healthy hypertrophied kidney for the diseased organ. But cystoscopy is impossible in some cases of renal tuberculosis owing to the irritated and contracted bladder and in such cases it is well to remember that compensatory hypertrophy occurs, since experience teaches that the prognosis is better where compensation has already taken place.

Duration of Symptoms:

Longest 20 and 24 years not included in computing the average duration.

Shortest three weeks.

Average for 100 cases, 23 months. Such a longer average duration is a reflection on the profession though we must not lose sight of the fact that many patients do not consult any physician until symptoms have been present for some time. On the other hand

some of the patients—17 per cent—were treated for longer or shorter periods or operated on, for the following conditions:

"Cystitis"	7
Appendicitis	3
Gynecological pathology	5
Movable kidney	1
Stricture of posterior urethra	1
Vesical calculus	1
Hip disease	1
Neurosis	2
Ulcer of stomach	2

Operations Performed Which Failed to Relieve Symptoms:

Galvanocauterization of the vesical neck, suprapubic cystotomy, suspension of uterus, myomectomy, appendectomy, hysterectomy, nephropexy, nephrotomy for suspected calculus.

First Symptoms: 122.

Pollakiuria	38
Dysuria	17
Vesical pain	4
"Cystitis"	3
Stoppage of urine (retention)	1
	63

or 51 %

Hematuria	11
Pyuria	4
	15

or 12 %

Renal or lumbar pain	29
Renal colic	4
Ureteral pain	1
Anuria	1
Tumor	2
	37

or 30 %

Chill	2
Fever	1
Weakness	1
Iliac pain	1
Vulval pain	1
Appendiceal pain	1
	7

Here again the significance of vesical symptoms is seen since in 63 cases the first symptom referred to the bladder while in only 37 was the kidney referred to. The 15 cases in which pyuria and hematuria were the first symptoms should not be added to either since both may refer to either the bladder or kidney.

Kidney Involved: 119.

Right 62, Left 51, Both 6.

Microscopic Examination for Tubercle Bacillus: 83.

Positive 55, or 66 % negative 28.

Today the percentage of positive results would probably be much higher since Crab-

tree's method of centrifugation gives a much larger percentage of positive findings than the usual method employed in most of these cases. As mentioned previously in the presence of symptoms of renal tuberculosis pus without detectable bacteria in the urine is strong evidence of renal tuberculosis.

Guinea Pig Inoculation: 4.

Positive 3 negative 1.

Since it was mentioned only four times, guinea pig inoculation is evidently not a popular procedure, probably because it requires several weeks time. Personally I have never used this method because I believe specimens properly centrifuged and stained will show the tubercle bacillus if any are present. If not present then the guinea pig will not show signs of tuberculosis even after waiting four to six weeks. Furthermore when pus is present in the absence of demonstrable bacteria and negative cultures, a tentative diagnosis of renal tuberculosis is certainly justifiable and if the function of the diseased kidney is much below par, nephrectomy should be performed. If the function is good nephrectomy should not be performed until tuberculosis has been proven. It is in this type of case that guinea pig inoculation may of aid.

The following functional report of a case I cystoscoped and later operated on for Dr. C. A. Daugherty, of Paris, Ky., shows the type of case in which I think a preoperative diagnosis of unilateral renal tuberculosis is justifiable even when the tubercle bacillus is not found. The right kidney in this case was hypertrophied. The diseased kidney was not greatly involved although symptoms had been present for about two years.

Mrs. A. B. 7, 16, 1919. Dr. C. A. Daugherty.

Cystoscopy: Bladder wall negative except somewhat light-absorbing. Left ureter slightly retracted, enlarged and edges of meatus rough and red. It is evidently sclerotic since the normal muscular contractions were not seen with the efflux. Efflux jet of pus.

Functional test: Both ureters easily catheterized with No. 6 catheters which were passed up 25 cm. and the cystoscope withdrawn.

	RIGHT	LEFT
Quantity	38.5 cc.	67.5
Appearance	Clear	Cloudy
Sediment	Negative	+
Pus Cells (Centrifuged urine)	Negative	++++
Albumin	Negative	++
Epithelial cells	+	++
Pus	Negative	++++

Smear

Bacteria	Negative	Negative
Culture	Negative	Negative
Phthalein Intravenously:		
Time of appearance.....	4½	4½
Percent in 20 min.....	21%	6%

NOTE: 10 cc. of urine escaped into bladder. This contained 11% of phthalein. Most of it probably escaped around right catheter since the left drained continuously and the right intermittently, but even if we add the 11% to the 6% of the left there is still 4% in favor of right kidney. The bladder urine was also more like that of the right side in color than that of the left. This also points to its escaping around the right rather than the left catheter. The great difference in amount from the right and left side also favors escape around the right catheter but of course this is not so significant since there is a pathological polyuria on the left side.

Diagnosis: Pyonephrosis sinistra. The absence of bacteria and the negative culture favor a tuberculous origin though of course it may be due to a stone or an infection of long standing.

CONCLUSIONS

1. Renal tuberculosis is very common and especially so during the third and fourth decades of life. There is practically no difference in the relative incidence of non-tuberculous pyonephrosis, renal lithiasis and renal tuberculosis. Lesions pathologically classified under these three heads constitute about seventy per cent of all surgical lesions of the kidney.

2. Vesical rather than renal symptoms predominate. If both vesical and renal symptoms are present, the vesical symptoms will antedate the renal symptoms in the majority of cases. Occasionally there are no symptoms from either the kidney or bladder, the patient merely complaining of loss of strength and weight.

3. Fewer mistaken diagnoses will be made and the duration of the disease before diagnosis will be shortened if cystoscopy is performed in every case where the pathological urinary findings remain unchanged or only slightly so after several treatments of the bladder.

4. If the catheterized bladder specimen shows pus, no bacteria, and is negative on culture, cystoscopy should be performed without treating the bladder, unless the cystitis demands palliative treatment preparatory to cystoscopy. If the bladder urine shows tubercle bacilli of course ureteral catheterization and functional tests should be performed as soon as possible.

5. Since typical shadows occur in about 20 per cent of cases of renal tuberculosis, radiograms should be made before cystoscopic examination whenever possible.

6. Even though seventy to eighty per cent of these patients have constitutional symptoms such as loss of weight and strength, fever, chills, and night-sweats it is unfair to the remaining twenty to thirty percent who are in fair or excellent health, to await such constitutional symptoms before making a diagnosis.

7. Repeated microscopic examinations of the urine, following the method of Crabtree, will show the tubercle bacillus in 75 per cent of cases.

8. Naturally guinea-pig inoculation will be negative unless the tubercle bacillus is present and if present it will probably be found under the microscope if diligently searched for, provided a good technic is used. Consequently the guinea-pig test is not often indicated since it is a slow and somewhat uncertain method.

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32. The Surgical Treatment of the Tubercular Ureter in the Female. Douglas Bissell, *Surg. Gyn. and Obst.*, XXI, p.p. 615.
33. Chirurgische Klinik der Nierenkrankheiten. J. Israel.
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THE TONSILS, TEETH AND NASAL ACCESSORY SINUSES AS A SOURCE OF FOCAL INFECTION*

By J. A. STUCKY, Lexington

Focal infection as a cause of many of the ills to which the flesh is heir is now in the limelight of the medical world, and the tonsils, teeth, and nasal accessory sinuses are in the "close up spot-light," especially since the findings of Rosenow, Delafield and Pruden. It has been established beyond the question that "rheumatic arthritis is most often the result of the infection of the tonsils and nasal accessory sinuses," though a sweeping modification is added when the further statement is made by the same authorities that "many forms of infection are embraced under the term rheumatism and that it is quite possible that bacteria exists as a cause which are ultra-microscopic." In the past eight months my own views regarding the tonsil as a causal factor have changed most materially especially since I have been having cultures made from fistulous crypts in tonsils so small as to be invisible, without pulling the anterior pillar well forward.

In addition to my own observations along this line I have been in constant touch with several other observers who have more complete facilities and a much larger number of patients to observe. Not only this, but they see the case at the time of admission, the re-

*Read before the Fayette County Medical Society.

sult of the clinical and laboratory findings are recorded, and if the focus of infection is found to be in the tonsil, this is completely enucleated and the results carefully observed for weeks and months afterwards. So astonishing have been my own observations that I am almost willing to accept the statement of some of the most eminent diagnosticians in this country, "that eighty per cent of the diseases of the human body are due to causes located above the collar bone." It is hardly necessary to mention that the pathogenic organism is carried into the tonsil tissues through the crypts.

These are twelve or fourteen in number, some of them with openings and others closed either congenitally or from frequent inflammation. If these crypts unite large cavities are formed between them which fill with the product of decomposition. After repeated attacks of inflammation the mucous wall breaks down allowing large pockets to form which fill with decomposed material of a caseous nature giving a foul odor. This substance, of a yellowish color, is often easily squeezed out of the crypts and is mistaken for pus.

The plica of the tonsil is a part of the anterior pillar, often stretches over the tonsil closing the crypts, producing the most dangerous of all tonsils because it is phymosed, which results later in becoming submerged. It is this condition that is a most important factor in producing infection. "That the tonsil is a gland which promotes absorption was demonstrated by Jonathan Wright, of New York, who smeared the tonsil with butter containing carmine and the next day found it deep down in the lower substance of the gland." Later a number of investigators "found fats injected in the tonsils of a guinea pig and rabbit, in the lymphatics of the neck after periods ranging from a day to a week. These experiments show the accessibility of the economy in general to infections from these glands." The larger number of cases I have met with which proved to be of undoubted tonsil infection was those involving the joints and muscles of the leg and arm. Several have been of cases giving no evidence of any organic lesion but were typically those of asthenia and complained of impaired digestion, constipation and other symptoms due to faulty metabolism. In acute cases where the joints were involved and there was elevation of temperature and severe headache, the culture from the tonsil proved to be a mixed infection in which were found either the streptococci or the streptococcus hemolyticus.

In the more chronic cases, between the age

of thirty and fifty, the culture proved to be staphylococcus aureus or albus, with a mixture of different bacteria, evidently the result of food or mucous putrefaction in the crypts. The cases showing a pure culture of staphylococcus proved the most obstinate in that the entire tonsil was covered with a pulsatious, dirty exudate, at first glance appearing to be a diphtheritic membrane. Cases of this kind were very septic, typically asthenic and the local condition required active treatment. When the pseudo-membrane disappeared half or more of the tonsil sloughed off with it. Without a culture, these would be easily mistaken for diphtheria.

As before mentioned the most dangerous tonsils are the small phymosed and submerged, which can only be found by close inspection. I have been surprised in some cases to find apparently the entire absence of the tonsil save for a small opening, out of which mucopurulent fluid could be squeezed. Close examination with a bent flexible probe revealed the presence of a fistulous crypt half inch or more in depth. When the gland was removed it was nearly the size of an ordinary chestnut. Such tonsils as these are more dangerous than the larger tonsils which protrude toward the middle line of the pharynx, because the latter are partially drained by each act of swallowing, and the former are completely covered. The fact that they mechanically interfere with respiration besides containing septic poison does not make them as dangerous as the small phymosed ones. Not every case of enlarged or submerged tonsil is septic. I have frequently found the culture showed nothing but putrefactive bacteria. Even these are dangerous because of being suitable culture beds for more virulent bacteria, cocci and bacilli.

What has already been said refers to the tonsil as a focus of infection in those past twelve years of age. It is a fact so well known and accepted that the majority of cases of ear, nose and throat disease, the physically undeveloped and mentally backward of childhood, are directly due to infection of the tonsils and adenoid, that no special mention will be made of these. I do not recall ever seeing a case of acute suppuration of the middle ear, or mastoiditis in a child whose throat and nasopharynx was free from disease, except in cases of scarlet fever or measles. Many cases of tinnitus aurium, ankylosis of the ossicular chain with retraction of the drum head, with consequent diminished hearing, so frequently met with in middle life are due to adhesive bands partially closing the orifice of the eustachian tube caused by atrophied adenoid tis-

sue, which interfered with ventilation and drainage of the middle ear.

In several cases of thyroid, and thymus enlargement and in many cases of involvement of the cervical glands, and in two cases of acetemuria I have found the cause to be in the phymosed submerged tonsil. Where the clinical evidence in a case points without doubt to some focal point of infection, and where transillumination of the head, and inspection of the tonsils from which cultures have been made, is not sufficient to make a differential diagnosis conclusive enough, evidence of invasion of the lymphatics by infection is sometimes of great value in helping us to locate the predisposing cause. "The deep fascia lymphatic nodes empty into the superior deep cervical nodes and drain all the accessory sinuses and the orbit. These nodes are never affected by diseased tonsils for the infection is carried into the inferior deep cervical nodes lower down in the neck. This fact will sometimes be of value in enabling us to locate our areas of infection." (Askinson.)

TEETH

Next to the tonsil, the teeth as a foci of infection occupy a conspicuous point in the diagnostic spotlight. Aside from the evidence gained by inspection and laboratory findings which clearly reveal evidence of pyorrhoea, we must rely upon the roentgenogram for aid in discovery and location of the suspected foci. Unfortunately these are frequently misleading hence disappointing because removal of the suspicious tooth too often brings no relief. This may be due to faulty technique in making the plate, or to our lack of skill in correctly interpreting it; for these reasons we prefer to leave the interpretation to the expert radiologist. Aside from general malaise, asthenia and reflex gastrointestinal disturbance I see many cases of functional eye and ear troubles which are relieved by the removal of a suppurating tooth. My own observations are that infection of the teeth can do more towards completing and intensifying the vicious circle of infection causing eye, ear, nose and throat trouble than any one thing.

ACCESSORY SINUSES

I have no record of a case of arthritis in which I could trace the focus of infection to the nasal accessory sinuses, but one of my correspondents (Zimmerman) reports fourteen cases which were relieved by getting rid of the sinus infection. I have had a number of cases of suppuration of the middle ear and mastoid process in adults which were due to suppuration in one or more of the accessory

sinuses. Within the last two years I have had three cases of loss of sense of smell (anomia) the result of suppurative ethmoiditis following the influenza. (I have had nine cases in which influenza bacillus and streptococcus hemolyticus was found one or two years after the attack of influenza.)

The special organ most seriously involved in accessory sinus infection is the eye, often resulting in iritis, irido-cyclitis and phlyctenular keratitis. In two cases orbital cellulitis and suppuration accompanied ethmoid infection. As serious as are these they do not equal in number or gravity the cases of choked disk, neuro-retinitis and choroiditis frequently seen, in which the foci of infection is found in the posterior ethmoid cells and sphenoid sinus.

By far the most frequent misleading and unyielding condition met with by the practitioner and neurologist, in which the foci of infection is to be found in the accessory sinuses is, *Headache*.

Most observers agree that a typical ocular headache grows worse toward evening and is better after a night's sleep. Frontal sinus headache and migraine are usually worse in the morning. Ocular headaches are usually bilateral, the pain likely to be frontal or temporal, and is relieved by correction of refractive errors. Nasal and accessory sinus disease in its relation to headache is of peculiar interest because of comparatively recent discoveries in this field of observation. The headache of frontal sinus congestion and empyema, is intense and almost unbearable, and is worse in the early morning hours, is aggravated by stooping or by any exercise which jars the body. The inner angle of the orbit is sensitive to pressure and mental activities are diminished. The sensory nerve supply of the nose and accessory cavities is from the first and second branches of the fifth nerve. The anterior and posterior ethmoidal nerve from the frontal branch of the first or ophthalmic division, innervate the mucous membrane of the anterior portion of the septum, the anterior ethmoid cells and the frontal sinus. The second or maxillary division supplies the floor of the nose, the maxillary antrum, while the posterior portion of the nasal cavity, and septum and the posterior ethmoid cells and sphenoid rise from the sphenopalatine ganglion.

Some have advanced the theory that diseases which produce headaches but which at the same time allow the sufferer to live his allotted life, are disorders which involve the nerves independent of the brain centers. So disease of the nasal cavities and accessory sinuses excepting the pus cases, may continue

through a lifetime, incapacitating the patient to a certain extent, causing much suffering, but not directly causing death.

"The three varieties of nasal disease producing headache and eye disorders which are generally unrecognized are (1) closing of the frontal sinns without suppuration, (2) the syndrome of ganglion neurosis, (3) hyperplasia of the ethmoid cells and sphenoid sinns." (Sluder.)

Negative pressure causes hyperaemia followed by congestion and pain and the pressure may be the result of obstruction to the outlet of the frontal sinns through a deflected septum, a septal spur, hypertrophied or adherent middle turbinate or from tumor formation which causing the obstruction, this in turn resulting in absorption of the air within the sinuses. To differentiate a pain caused by a negative or positive pressure is not always easy, because similar symptoms may be produced by the action of toxic substances brought to the nerves from other parts of the body by way of the blood.

In the discussion of the topics in this symposium we will do well to keep in mind, as pointed out by Billings (Jour. A. M. A., April 1920) that "A focus of infection may give rise to a focal infection or it may give rise to intoxication of the body. Infection means the invasion of the body by micro-organisms that have the power of reproduction in the body, of producing reactions within the tissues of the body and the reaction producing abnormal phenomena, which we term clinical manifestations of disease. Focal infection means the invasion of the body from a focus of pathogenic organisms, and these organisms have the power of reproduction or multiplication within the body. Much of the fallacy and failure in the treatment or management of the patients who suffer from what may be proven to be focal infection is due to the fact that we remove a focus, which may be the right one and then neglect any further management of the patient. If we have removed the true focus, we have simply prevented the invasion of the tissue by additional organisms from the primary focus. Focal infection is usually an invasion by pathogenic agents of the tissues through the blood stream. They lodge in the tissues, they produce reactions, dependent on their virulence. They remain there if the defenses of the body are not sufficient to kill them or at least drive them from the body. Our duty therefore, is to build up the resistance of the body against the invaders already there, by all of the known means of support of the patient from the beginning of the treatment.

DIVERTICULUM OF THE SMALL INTESTINE*

By FRANK T. FORT, Louisville

The subject of this report is Mr. C. T., aged 26 years. Family history: father 60 years old, living, small stature, and delicate; mother, 56, living, neurotic; several brothers and sisters living.

Since childhood the patient has suffered at irregular intervals from attacks of severe pain in the umbilical region. After being inducted into the service of the U. S. Army he had one or more attacks of abdominal distress.

On June 18, 1920, he had a severe attack, and a local physician was called. The next day he was but little improved, still suffering; a hypodermic of morphine was administered and he was brought to Louisville a distance of nearly 100 miles. When examined after admission to Sts. Mary and Elizabeth Hospital a provisional diagnosis of appendicitis (atypical) was made. The leucocyte count was more than 20,000; greatest point of tenderness near umbilicus on right side.

Operation: Abdomen opened through outer border of right rectus muscle; peritoneum slit when a point of material resembling "soup" escaped showing beginning peritonitis; the appendix was somewhat congested and was removed, but I was quite sure the appendix was not the offending pathology; the incision was then enlarged and my hand introduced which came into contact with a tumor or mass held in place by "cobweb" adhesions; these were separated and the tumor delivered. It was found to consist of a diverticulum of the small intestine situated about midway between the stomach and the cecum; it was the shape and about the size of a stomach; it had become twisted half way upon itself and had produced an incomplete volvulus. The intestine was clamped in two places, the tumor removed, and an end-to-end anastomosis of the intestine made. The patient made an uneventful recovery.

I think the diverticulum was of congenital origin, and the attacks at irregular intervals were caused by the tumor becoming twisted which later untwisted itself, until the last attack which for some reason was possibly more severe, when instead of the tumor becoming untwisted adhesions formed and beginning general peritonitis developed which would have produced death within a few days had the patient not been operated upon.

*Case report with exhibition of specimen before the Jefferson County Medical Society.

Kentucky Medical Journal

PUBLISHED BI-MONTHLY BY
THE KENTUCKY MEDICAL ASSOCIATION
Incorporated

Editorial and Business Office, Cor. State and Twelfth Sts.

Entered as second class matter October 22, 1906, at the Postoffice at Bowling Green, Ky., under act of Congress, March 3, 1879.

Subscription Price\$2.00

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Next Meeting Seelbach Hotel

Louisville, September 19, 20, 21, 22, 1921

COUNTY SOCIETY REPORTS

Allen.—The Allen County Medical Society met in the County Court room in Scottsville, January 22, at one P. M., with the following members present; Drs. G. R. Keen, J. E. Pace, A. O. Miller, P. G. Graves, L. Graves, H. M. Meredith, W. E. Willoughby, C. A. Calvert and E. A. Whitlow.

The meeting was called to order by Dr. Keen, the President. It being the annual meeting and time for the election of officers for the year 1921, the society proceeded to the election of officers, the result being as follows: President, E. A. Whitlow; Vice-President, C. A. Calvert; Sec-Treas., J. E. Pace.

Alternate delegate to the State Association, A. O. Miller; member board of Censors, C. W. Holland.

A motion to make the state and county dues \$5 carried unanimously. The secretary was ordered to have 100 cards printed for notifying members of the times of meeting.

A discussion of the question of a full time health officer was engaged in by all members present, and the following resolution was passed unanimously: That the president appoint a committee of three members to confer with the Fiscal Court in regard to the fee for health officer and that no member of the Allen County Medical Society make a proposition to the Fiscal Court or accept a proposition from the court as to the office until the report of the committee is made to the medical society and approved by same.

Lattie Graves, H. M. Meredith, and J. E. Pace were appointed as members of this committee.

J. F. PACE, Secretary.

Ballard.—At a recent meeting of the Ballard County Medical Society the following officers were elected:

Ezra Fitzworth, President; J. W. Mishew, Vice-President; G. L. Thompson, Secretary-Treasurer; W. A. Ashbrooks, Delegate; W. A. Page, Alternate; J. W. Mishew, Censor.

G. L. THOMPSON, Secretary.

Carlisle.—The Carlisle County Medical Society met in its regular quarterly session in J. F. Dunn's office, Arlington, March 1, 1921, at 4 P. M., with the President, R. C. Burrow in the chair.

After divine invocation by Dr. Hocker, the minutes of the previous meeting were read, and approved.

The committee on arrangements reported that they had secured J. F. Dunn's office for the place of meeting—and that supper would be prepared by Hotel Victor. Committee on Hospital reported that they had not made any progress.

H. T. Crouch read a paper on "Acute Paren-

chymatus Nephritis, Diagnosis and Treatment." H. A. Gilliam read a paper on "Chronic Parenchymatous Nephritis, Diagnosis and Treatment." The essayists were in form and gave us two excellent papers.

J. T. Hocker opened the discussion on these two papers, emphasizing some of the most important points, after which all members present discussed these subjects thoroughly.

J. F. Dunn read a very interesting paper on "Dilatation of the Heart, and its Treatment." Dr. Marshall opened the discussion followed by all present.

The following were present: Drs. H. A. Gilliam, R. C. Burrow, W. L. Mosby, H. T. Crouch, T. J. Marshall, J. F. Dunn, W. Z. Jackson, R. T. Hocker and G. W. Payne.

Motion carried to have an all day session with Dr. R. C. Burrow, of Cunningham, the first Tuesday in June.

GEORGE W. PAYNE, Secretary.

Christian.—The Christian County Medical Society met in regular session at 1:30 P. M., with J. W. Harned in the chair and P. E. Haynes acting secretary, in the absence of W. S. Sandback, vice-president, and E. McDowell Trabue, secretary.

Members and visitors present: J. W. Harned, Hopkinsville; P. E. Haynes, Hopkinsville; J. L. Barker, Pembroke; W. L. Trabue, Hopkinsville; Oscar Flenor, Hopkinsville; Randolph Dade, Hopkinsville; F. M. Stites, Hopkinsville; W. E. Reynolds, Hopkinsville; J. W. Rice, Hopkinsville; F. M. Grace, Hopkinsville; J. A. Southall, Hopkinsville; and later, J. G. Gaither, Hopkinsville; W. S. Sandback, Pembroke and E. McDowell Trabue, Pembroke.

The minutes of the preceding meeting were read and approved.

W. L. Traube presented a very interesting and instructive paper emphasizing the importance both to the physician and dentist, and to the patient, of closer cooperation between the dentist and physician. This paper was enthusiastically received and discussed by all present.

Motion by Dr. Stites, seconded by Dr. Haynes, that Dr. F. M. Grace, Hopkinsville, be accepted as member of the society upon recommendation of the Board of Censors. Carried.

Motion by Dr. Dade, seconded by Dr. Stites, that the American Life and Accident Insurance Company be notified that unless orders properly executed by their policy holders in favor of a physician, be paid by them to the physician, if paid at all, the membership of this society would refuse to execute any claims whatever for that company. Discussed by Drs. Stites, Southall, Barker, Trabue, Reynolds, Sandback, Gaither, and Dade. Amendment proposed by Dr. Barker that instead of taking such drastic action at this

time, the society through its secretary confer with proper officials of said insurance company, and protest its action in not paying to physicians the claims of its policy holders, when accompanied by an order signed by the policy holder, and that the secretary report to the society at its next meeting. Amendment accepted by Dr. Dade, and motion and amendment carried.

E. McDOWELL TRABUE, Secretary.

Clay.—At the regular meeting of the Clay County Medical Society the following officers were elected:

J. R. Burchell, President; G. P. Webb, Vice-President; J. L. Anderson, Secretary-Treasurer.
J. L. ANDERSON, Secretary.

Grayson.—At the annual meeting the following officers were elected:

O. R. Stuteville, President; J. W. Conklin, Vice-President; C. L. Sherman, Secretary-Treasurer; S. H. Armes, Delegate.
C. L. SHERMAN, Secretary.

Hardin.—The following officers were elected:

J. C. Mobley, President; S. L. Stull, Vice-President. D. E. McClure, Secretary-Treasurer; C. N. Rogers, Delegate; J. M. English, H. R. Munz, and C. C. Carroll, Censors.
D. E. McCLURE, Secretary.

Harrison.—The Harrison County Medical Society held its regular monthly meeting at the Elks' Club Room, January 3, 1921. Members present: Swinford, McIlwain, Morgan, N. W. Moore, Smiser, Rees, W. B. Moore, Martin, and Wells. Meeting called to order by President. Minutes of last meeting approved as read.

M. McDowell reported case of gun-shot wound of abdomen. On opening abdomen it was found the bullet had perforated the bladder and made a large opening in intestine; four inches of intestine resected, and end to end anastomosis made on bladder perforation. Patient has made good recovery.

H. T. Smiser reported patient whose only symptom is delirium; temperature and pulse normal; urinary examination negative.

J. M. Rees reported case of incontrollable diarrhea in patient who gave history of syphilis twenty year ago. No other clinical symptoms; Wassermann positive.

Dr. Martin reported case of pregnancy in primipara 38 years old, complicated by multiple uterine fibromata. Six weeks after labor a myomectomy was done and patient made rapid and uneventful recovery.

E. S. McIlwain reported case of traumatic rupture of Iris.

Josephus Martin read paper on "Use and

Abuse of Vaccines and Serum." Paper discussed by J. E. Wells, N. W. Moore, Smiser, Mellwain and Morgan.

W. B. MOORE, Secretary.

Hickman.—The following officers were elected at the regular meeting.

E. B. McMorries, President; E. D. McCarty, Vice-President; W. F. Peebles, Secretary-Treasurer; Charles Hunt, Delegate; W. R. Moss, Chas. Hunt and W. T. Berry, Censors.

W. F. PEEBLES, Secretary.

Jessamine.—At the regular meeting of the Jessamine County Medical Society the following officers were elected:

D. R. Welch, President; D. A. Penick, Vice-President; J. A. Van Arsdall, Secretary-Treasurer; T. R. Welch, Delegate; W. M. Mathews, D. A. Penick, T. R. Cook, Censors.

J. A. VAN ARSDALL, Secretary.

Lincoln.—The following officers were elected:

Alberta Carpenter, President; J. T. Pegton, Vice-President; Lewis Jones, Secretary-Treasurer; E. J. Brown, Lewis Dower, Delegates; W. B. O'Bannon, M. L. Piper and W. V. Childress, Censors.

LEWIS J. JONES, Secretary.

Lyon.—At the regular meeting of the Lyon County Medical Society the following officers were elected:

J. H. Hussey, President; T. L. Phillips, Vice-President; W. G. Kingsolving, Secretary-Treasurer; H. H. Woodson, Delegeate.

W. G. KINGSOLVING, Secretary.

Marion.—At the regular meeting of the Marion County Medical Society the following officers were elected:

J. T. P. Wickliffe, President; G. W. Hill, Vice-President; C. B. Kobert, Secretary-Treasurer; C. B. Kobert, Delegate; O. A. Mitchell, Alternate; R. C. McChord, Edward Kelley, G. G. Thornton, Censors.

C. B. KOBERT, Secretary.

McCracken.—The McCracken Medical Society met in regular session Wednesday, March 9, at 8 C. M.

We had the pleasure of having as our guest, William M. Engelbach, from St. Louis, and R. B. H. Gradwohl of the same city. Dr. Gradwohl has established here a pathological laboratory.

After the preliminaries of the business session, which were short we went into a scientific meeting. R. B. H. Gradwohl gave an interesting illustrated lecture with a portable moving picture machine concerning the chemistry of the blood and the laboratory methods the uniqueness of

it and the fact that we have such a splendid means of demonstrating scientific lessons by means of the "movie" also made it very interesting.

W. H. Engelbach was now introduced and gave to our society one of the best lectures which we had the pleasure of hearing for a long time.

The subject was: "Disorders of the Internal Secretion of the Ductless Glands and their Differential Diagnosis." I shall not try to give you a resume of the splendid lecture which we heard the clear cut explanation of the differential diagnosis between the hyposecretions and hypersecretions of the pituitary, the thyroid or the ovarian but that we all gained a great amount of very useful information I am sure.

The lecture was highly instructive and profitable to all present as was evidenced by their very marked attention and the comments afterwards.

We had fifty-two doctors present, fifteen of whom came from the adjoining counties of Graves, Marshall and Ballard. It was only one of our regular Wednesday evening meetings but we propose to have one of the best societies in the state and we do not have always to send out of Paducah, to get some interesting papers to discuss.

VERNON BLYTHE, Secretary.

Muldraugh Hill.—The regular meeting of the Muldraugh Hill Medical Society was held at Elizabethtown, December 12, 1920. Meeting called to order by the president, W. J. Shacklette of Glendale.

A. D. Willmoth, Louisville, reported a case of intestinal obstruction in a boy 20 years of age in which he did an anastomosis around the tumor, which was in the descending colon, and six weeks later resected the tumor.

Frank Strickler, Jr., Louisville, reported a case of intestinal obstruction due to an unusually long appendix being wrapped around the intestine.

R. C. McChord, Lebanon, reported a case of pelvic tumor in a woman 33 years of age who had been bleeding profusely; was septic and in very poor condition before operation. Later he opened the tumor, turned out the clots sewed the edges to the anterior abdominal walls and packed the tumor cavity with gauze. Patient made a nice recovery.

J. S. Lutz, Louisville, reported a case of pregnancy which went to full term with normal urine and blood pressure and then suddenly developed a S. B. P. of over 200 with headaches and other symptoms of toxemia of pregnancy. Patient was delivered at full term and made a good recovery.

C. C. Carrol, White Mill, Ky., reported a case of very severe fracture of elbow, with good functional result, in order to show the great difficulties under which the physician in the country must work without the aid of the x-ray.

Stuart Graves, Louisville, reported a case of "Complete Traumatic Rupture of Kidney," giving in detail the clinical history and the autopsy findings. This was one of the most interesting cases ever presented before the society. Discussed by Drs. McChord, Grant, Willmoth, Zimmerman and Guy Aud.

C. C. Carrol, White Mills, read a paper on "Pneumonia, Its Management and Treatment." Dr. Carrol's paper was well prepared and brought out the newer ideas regarding this disease. It was of such interest that it was discussed by practically every one present.

Frank Strickler, Jr., Louisville, presented a paper on "Diagnosis of Pathological Conditions of the Gall Bladder," and the differential diagnosis of them. Discussed by Drs. Zimmerman, Fugate, Baldauf, Pope, Layman and Guy Aud.

R. T. Pirtle, Louisville, presented a paper on "Whitman's Abduction Treatment of Fracture of Hip," and brought out the advantages of this method in certain class of cases over other methods. Discussed by Drs. McChord, Arnold, Hagan, Strickler, Zimmer and Guy Aud.

The papers of Drs. Graves, Carroll, Strickler and Pirtle were of such a character and were so generally discussed that it is impossible to do them credit in so brief a report. They will appear in an early issue of the Journal.

This is perhaps the best attended and most universally enjoyed mid-winter meeting the society has held. There were about 35 doctors present and the discussions were so many and interesting that the program lasted until almost 5 P. M. Let's make every meeting just as interesting and instructive.

GUY AUD, Secretary.

Shelby.—At the regular meeting of the Shelby County Medical Society the following officers were elected:

Earle Eversole, President; A. C. Weakley, Vice-President; W. H. Nash, Secretary-Treasurer; Lowry Beard, Delegate.

W. H. NASH, Secretary.

Roentgenographic Evidence of Ulcer Healing.—Evidence is presented by Jacob Buckstein, New York, (Journal A. M. A., Jan. 22, 1921) as to the effectiveness of the principle of rest as applied to the treatment of gastric ulcer. The roentgen-ray disclosed a large lesion of the lesser curvature. For the purpose of obtaining a maximum degree of gastric rest, the patient was fed through an intestinal tube over a period of eight weeks. The fluid was introduced by the drop method. At the end of that time the tube was removed and feeding by the mouth begun.

NEWS ITEMS AND COMMENTS

The New York Post-Graduate Medical School and Hospital announces that there will be available this year six scholarships under the terms of the Oliver-Rea Endowment.

The purpose of the Endowment is to award scholarships to practising physicians of the United States to defray in full the expenses of tuition at the New York Post-Graduate Medical School.

According to the wishes of the donor, physicians in the State of Pennsylvania will receive preference in the award of these scholarships.

Applications may be sent to the President of the New York Post-Graduate Medical School and Hospital, 20th Street and Second Avenue, New York City.

THE FORUM

To the Editor:

The Board of Managers of the Kings Daughter's Hospital at Ashland, Ky., contemplate adding an Assistant Superintendent to our organization with the specified duties of handling our laboratory and x-ray work, teaching in our training school and such other matters as the superintendent may direct. We prefer the services of a woman, if she can be obtained, and I am taking the liberty of bringing our need to your attention, hoping that you may be able to refer some one to us or refer us to some suitable person or source of possible supply.

Very truly yours,

W. DUDLEY,

Secy. Board of Managers.

Bodily Mechanics and Obscure Intestinal Conditions.—Faulty bodily mechanics is held by Talbot and Brown to be responsible for a great loss of efficiency. It is common to all ages, is easily corrected and can be corrected most economically during childhood. It is responsible in most instances for diminished powers of digesting fats in children and is the cause of a certain amount of chronic constipation. It is the background and probably the cause of many, if not most, cases of recurrent vomiting. In many instances the symptom of acute abdominal pain in children, when associated with chronic constipation, is due to poor bodily mechanics. These symptoms are often so severe that they are confused with those of acute intestinal obstruction due to other causes. In the cases cited by the authors in which the faulty body mechanics have been corrected, in connection with the other treatment, the patients have all shown a more speedy recovery than is seen in cases without this correction.

KENTUCKY MEDICAL JOURNAL

BEING THE JOURNAL OF THE KENTUCKY STATE MEDICAL ASSOCIATION

Published Under the Auspices of the Council

VOL. XIX. 

BOWLING GREEN, KY., MAY, 1921

No. 5

EDITORIAL

THE BOSTON MEETING, A. M. A.

The American Medical Association meets in Boston, June 6 to 10. No other city stands so well with itself, and few with outsiders, as the great metropolis of New England. Kentuckians who were present at the Boston Meeting ten years ago will bear witness both to the splendid scientific meeting then arranged, and the boundless hospitality of our conferees. The Association never had a more successful meeting. It is hoped that a large number of Kentucky doctors will attend this year and bear witness to the great progress that has been made in medicine in the State since the last Boston meeting.

PROGRAM FOR 1921.

The Committee on scientific work for 1921 consists of Dr. J. A. Stucky, President-Elect, Dr. W. Owlsey Grant, of Louisville, and the Secretary. Members who desire to make suggestions in regard to the program are requested to write to Dr. Grant, Francis Building, Louisville.

The Committee is attempting to arrange the program so that it will appeal to every practicing physician in Kentucky. If the thoughtful members of the profession will take a little interest in its arrangement in advance, it will do far more good than to criticize its incompleteness at the time of the meeting.

THE ANNUAL SESSION

The annual session of the Kentucky State Medical Association will be held at the Seelbach Hotel in Louisville, September 19 to 22 inclusive. All of the sessions and exhibits will be on the tenth floor of the hotel.

Meetings and conferences of all sorts and kinds are multiplying with a rapidity that makes one dizzy, but to the physician there is

no other meeting so important as the annual session of this state organization.

Of course, the physician who is not a regular attendant at his county society meetings does not get the most good out of either the practice of medicine or attendance on any other organization. More county societies are getting in regular work now than any time since before the war, and members are urged to help the work along by stimulating interest in the local organization.

The State association will be glad to arrange for outside essayists or clinicians at any meeting if called upon in advance.

NEW STATE HEALTH HOME

We congratulate the State Board of Health upon the purchase of the splendidly appointed building in which it has been housed for the past two years since its location in Louisville. This building is almost ideally located near the center of the business district in Louisville, and is easily available, not only for the profession of Louisville but for our state visitors who are lodged at the nearby hotels.

The Board is to be especially congratulated upon the excellent trade that it was enabled to make through the generosity of the owners of the building, the president and trustees of the University of Louisville and prominent Louisville citizens. Architects estimate that it would cost \$150,000 to put up a new building with the same facilities as the one just purchased. The Board paid \$33,100, of which \$18,100 was paid in cash without the expenditure of one cent from the state treasury. A mortgage of \$15,000 was assumed.

As the State Medical Association is also housed in this building, we know how much the members of the state will be in it, and we cordially invite all of them who are in Louisville to make it their headquarters and to see the splendid work that is being done. No other state has a real health home, and less than four are as well housed.

OUR ADVERTISERS

Have you read the advertising announcements in this issue? Most of our readers read our advertising pages. All of our members know that they are guaranteed against financial loss in dealing with our advertisers and their advertised products. Those who have the privilege of using our advertising pages have also the privilege of paying for the publication of the Journal.

The announcements contained in these pages are crisp, tell much of the progress in medicine and are of real value. We especially appreciate the attention that the wives of our members are paying the advertising pages. A recent letter from an advertiser states that he gets more inquiries from the families of members in Kentucky than from any other medical publication. This is a great tribute to the efficiency of the Journal and to the loyalty of our members.

FREE TYPHOID AND WHOOPING COUGH VACCINE.

The State Board of Health asks us to call the attention of the profession of the State to the fact that they are furnishing free typhoid and free whooping cough vaccine. This is furnished free upon condition that it will be administered without cost to the indigent, but a regular fee of not to exceed \$5 may be charged for those who are able to pay for its administration. These vaccines are manufactured in our own laboratory; the typhoid vaccine after the formula of the army, and the whooping cough vaccine after that of the New York City Board of Health. Write to the Laboratories of the State Board of Health at Louisville for such a supply as you need of either of these vaccines.

MORE NURSES

There is not a hospital in Kentucky which does not need more nurses. Quite a number of organizations interested in this matter are arranging to each secure one or more fine young women and place them in the training schools as their special representatives. It is suggested that each county medical society take this matter up and secure one or more young women who have an aptitude for this sort of work and place them in a training school. The City Hospital of Louisville needs forty right now, and every other training school in the state needs a few.

The training schools are trying hard to meet their responsibilities in this matter. The course is being improved, all of the heavy work, except that absolutely necessary in the

training of nurses, has been cut out, and arrangements are being completed for special training in the senior year where the pupil's aptitude indicates that she will do better work as a public health nurse, anesthetist, laboratory technician, or some other duty than in private nursing.

If every physician in the state will look his responsibilities in this matter squarely in the face and attempt to get one of the best educated, best bred and most capable women in his county interested in nursing right away, he will be performing a great public service.

BLOOD CULTURES AVAILABLE FOR EARLY DIAGNOSIS OF TYPHOID FEVER

The State Board of Health Laboratories, following their custom of keeping abreast of the demands of the profession, have prepared special containers for collecting blood specimens for typhoid fever cultures which are sent to physicians upon request with complete directions. Each outfit contains a bottle of sterile bile and a needle. Each step of the procedure must be done under strict aseptic precautions, and, if a syringe is used, it must be boiled five minutes. 2 c.c. (or 30 minims) of blood are necessary for the test. This should be put into the bile, sealed, and mailed immediately. Two days are required at the laboratory for the growth of the culture, when prompt reports are mailed out or wired, collect, if requested.

The early diagnosis of typhoid fever is important not only for the proper treatment of the patient, but for the equally vital matter of controlling the spread of infection. A positive diagnosis in the first week of the disease can only be made by the blood culture method.

Typhoid bacilli appear in the blood early in the disease, not infrequently in the prodromal stage. Cultures are positive in 90 per cent of the cases during the first week; while a negative report is not final, finding the organisms in the blood is conclusive evidence that the patient has active typhoid fever. The Widal is of corroborative value. Previous inoculation, or frequently a previous attack of the disease gives a positive Widal, while in an acute attack it does not develop until after the eighth or tenth day.

This step in advance has been made at the request of a considerable number of our physicians. The laboratory always appreciates suggestions which will help it to be more useful.

SCIENTIFIC EDITORIALS

SYPHILIS AND THE CENTRAL NERVOUS SYSTEM

That the spirochete in many instances seems to have a predilection for the heart and vascular system, is merely to state a trite and well-established fact. I have on several former occasions called attention to the interesting and valuable information the cardio-vascular system may give in the way of diagnostic data and the neurologist who fails to carefully interrogate and examine this great system of the human body when searching for neural syphilis, leaves behind many chances for correct diagnosis from the clinical standpoint. I think it may be safely said that few diagnosticians examine, *carefully measure* and *diagram* all aortas that come for diagnosis and treatment. The great tendency of the day is to "suspect" that syphilis may (?) be present, to then definitely depend on a Wassermann test, without that painstaking neurological and general physical examination that will reveal bodily and other symptoms indicative of syphilis, and among these must be reckoned the cardio-vascular symptoms. It is often in the vascular system of the central nervous system that the greatest havoc is accomplished and such changes take place as bring about localized deposits, inflammation, degeneration and roughening of arterial walls so that later in life crippling disease results. Nor must it be forgotten that as a result of syphilis we may have that interesting syndrome of cerebral arterial sclerosis, the diagnosis of which must be the conjoint work and effort of the neurologist and ophthalmologist. Here as in all cases of neurological disease and especially syphilis, the retinae may literally "map" out a diagnosis that would otherwise be very doubtful and at most conjectural.

It is in the blood vessels of the central nervous system that much havoc and crippling disease in later life is originated. That syphilis may be a prominent and sometimes the sole provocation of the vascular lesions that lead to hemorrhage, embolism and thrombosis cannot be denied. That streptococci may cause emboli and these in turn produce many disabling lesions is to be admitted, but I have seen cases that to my mind were unquestionably embolic where no matter how much we search, no streptococcic infection could be found in the history that warranted a casual relation. With hemorrhage and thrombosis, I think the specific relation is much more clearly defined and the latter I am satisfied is often present when we call it embolic. Here, again, causative propositions and therapeutic

outlooks are needed. Are we to believe that these are the result of a failure of arsenic, iodine or mercury on the one hand, or on the other insufficient treatment, carried over long periods of time or still further the failure of the system to react and form protective antibodies at the time of the primary infection. It is at present a matter rather *sub judice*, although I am inclined to believe that all three enter, more or less, into the problem with possibly the named category predominant. The practical point of the whole issue is an intelligent treatment of the patient, not the syphilis, the patient, persistent prophylaxis of disaster during the remaining years and an intelligent management, with promise of unusual results, of the paralytic and other sequelae that follow in the wake of the vascular disease.

CURRAN POPE.

POST DIPHTHERITIC OCULAR PARALYSIS.

In the October number of the *American Journal of Ophthalmology* there is a very interesting article by M. Lombardo of Brooklyn, N. Y., on post diphtheritic ocular paralysis with the report of three cases. He has gone into a very thorough discussion of the subject and I would commend the article to anyone wishing the latest information on the subject.

In my own experience I have seen but two similar cases and the fact that these were both cases of paralysis of the accommodation and that they occurred in brothers of about the same age makes it seem probable that their report may be of interest to my fellow practitioners.

The brothers were respectively 9 and 11 years of age. They had typical cases of tonsillar diphtheria from which the diphtheria bacilli were cultured. Both received 5000 units of antitoxin and made rapid and apparently complete recoveries. About three weeks later they were brought to the office with the complaint that they could not see. Everything was blurred for both distant and near vision. Their pupils were moderately dilated and responded sluggishly to light. Each was found to have a hyperopia of one and one-half diopters and with this correction they each saw 6-6. But could see nothing at reading distance. It required an addition of full three diopters to the distant correction to make it possible for them to read. The distant glasses were ordered and they were told that they must wait to read till the paralysis disappeared. At the end of about three months the accommodation was restored and they could read without glasses.

R. H. COWLEY.

ORIGINAL ARTICLES

SYMPOSIUM ON RENAL-OPATHY

NEPHRO-CARDIO-ARTERIAL
SYNDROME*

By CURRAN POPE, Louisville.

The time assigned is too brief to even consider any one of the aspects of the Nephro-Cardio-Arterial Syndrome. Anything said or written will be conspicuous by the absence or omission of many facts, but were all considered a volume would be produced and the ten-minute time limit exceeded. I shall simply try and present some few things that have impressed themselves upon me during a long number of years of practice. The remarks made may be rambling, disconnected and unrelated, but have seemed to be somewhat worth while as they represent garnered experience. Theory is often presented in tabloid papers; this I shall entirely ignore and proceed at once with the consideration of the few facts I care to present.

Every physician, surgeon and specialist has to meet this syndrome in some, if not many of his patients; it is frequently the underlying cause of mischief that superficially does not appear to be related as cause and effect. Here we find the *medico* confronted with the dual problem of underlying reno-cardio-vascular changes and the localized disease or disorder for which he has been called or consulted. If he fails to understand the meaning of the signs and symptoms of these earlier manifestations of underlying disease, his patient has indeed suffered by a misplaced confidence. Nor is the syndrome in its earlier manifestations simple and easy of demonstration; *per contra* its recognition at this time may be most difficult yet yielding its secret to him who truly seeks and analyzes.

In searching for the key to unlock the underlying mechanism, recourse must be had to many diagnostic measures before we may be certain of our case. I would condemn the present dependence upon perfunctory blood pressure, taking, oftentimes only the systolic pressure, which, while it may be indicative, is in reality overestimated and depended upon too readily, nor is it carefully studied after physical exertion. At this early stage of a careful and *frequent* study of the urine, night and day, its relation to diet and water drinking, may be found a very revealing and en-

lightening factor. Of the value of the cardiogram of pulse and vein none will make denial, but I have found in those that I make that it is only one factor in many to be considered. Perhaps the trained finger is not to be despised in its ability to estimate some changes taking place. I derive personally much satisfaction from the use of the ophthalmoscope, and through all the years of my practice I have resorted daily to the valuable stories it can tell to "the man who knows."

I can but hastily in passing note the great value to be derived from a careful study of blood sera by recent chemical methods, which study will be well worth while especially in the very early period of the disease. Another interesting and valuable feature is a carefully recorded case *history* and here we may find the *raison d'être* of reno-cardio-vascular disease. The renal mischief of which we treat does not spring into existence like Minerva, full-armed eap-a-pie, but is the result of long continued or oft repeated insults to the parenchyma and interstitial tissues of the kidney, reducing little by little the available functioning structure until death closes this strange and eventful history.

Where are we to look for the repeated insults that deprive an individual of portions of his renal parenchyma? In the acute infections. From birth, during childhood and adolescence the exanthemata, each tend to reduce the *quantum* and *qualite* of the kidney structure so that later, structural changes in the parenchyma and in the supporting or interstitial tissues come about with opposition to the free passage of the circulating blood, resulting in changes far distant from the seat of war. Each attack, each fresh invasion mean so much more strain and destruction. Considered from this viewpoint alone, we have a justification for quarantine and the preventive activities of Federal, State and urban authorities. I am my brother's keeper and must do nothing that will injure him or the body politic. An acute disease that does not kill *per se* may lay foundation for a crippled life, lessened efficiency and an eventual shortening of life through destructive influence upon the reno-cardio-vascular mechanism.

And the chronic infections? There are two: FOCAL and SYSTEMIC. Of focal infection I need say but little. The world is indulging in a perfect orgy of teeth and tonsil removal from the drunken effects of which it will arouse itself and finally regain a sane and safe middle-of-the-road attitude. These men must remember that store teeth are never as good as the genuine article and that the tonsil is believed by many to functionate and was not designed to support families by its

*Read before the Jefferson County Medical Society.

wholesale surgical removal. Many tonsils and teeth are removed recklessly with no good and sometimes bad results, when a thoughtful, reflective study would probably have brought to mind that these people all have gall-bladders and colons; that the male has a prostate and the female, pelvic organs and that there are other sources of infection that may filter much undesirable material into the blood.

Bacterial proteins, and the proteins arising from defective digestion and absorption of food, as well as certain metabolic changes in the body tissues are all powerful in imposing an added and difficult burden on a kidney already crippled by previous acute attacks in early life. And of the low grade systemic poisons which act slowly and continuously through the many passing years? At their heads stands neglected syphilis; a causative triumvirate, *directly* attacking kidney, heart and blood vessel, and *indirectly* producing action and reaction between all three I could write a panegyric upon the incompetency of many treatments of syphilis. In some few cases let us not forget tuberculosis and the metallic poisonings.

As the slow, but surely crippling influence of all the factors enumerated wears out the parenchyma of the kidney and increases the supportive or interstitial tissues, changes occur and with the evolution of time we begin to see the added influence of all of which we have so briefly sketched. Nature abhorring a vacuum compensates; then tries to maintain a balance, hence an hypertrophied left ventricle, perhaps an aortitis. Now, another field of symptomatology, pathology and therapeutics is entered, for we have then the fully developed and easily discerned *nephro-cardio-vascular syndrome*, so plain that he that runs can read. By this time the indefinite neural symptoms that have been so euphonesely labeled "neurasthenia," "auto-toxemia," and all their indefinite ilk, become plainly part of this syndrome with its retinal hemorrhages, temporary aphasia, transient paralyses, thromboses, cerebral hemorrhages, vertigo, headaches and symptoms *ad infinitum*. The general body suffers from closing arteries and malnutrition; from cardiac-muscular weakness, perhaps a mild myocarditis, which I have been pleased for many years to call "*chronic cardio-myasthenia*," to be later succeeded by a true degenerative myocarditis, with its decompensating and terminal results. Some golden and gladsome day when men and women seek their physician for the preservation of health and not the restoration from disease, much will be done to prevent this stage being reached, and if reached maintained with many years of energy and efficiency to the individual, giving him an opportunity to round

out the allotted time of the psalmist or longer.

In recent years progress has been made toward this greatly to be desired end, in which *medicinal* agents have to all practical purposes failed or possess limited value, but in which hygiene, regimen, diet, exercise, hydrotherapy, massage, mechanical measures and electrotherapy have proved their full quota of usefulness. A few therapeutic facts stand out in bold relief and may be briefly epitomized as follows: in *all stages* medicines offer but little help as compared to hygienic, dietetic and physio-therapeutic measures; that with one exception this applies even to the decompensative period of cardiac inefficiency. This exception is digitalis. To my way of thinking L. F. Bishop correctly characterizes digitalis therapy when he says: "there is no necessity to go outside digitalis for the use of analogous drugs. If any man ever could consider his mastery of the use of digitalis complete, then it would be time enough to take up something else."

By the time the specialists in the various domains of clinical medicine see these cases, causal medication, the mere checking or relief of focal and general infection and toxemia, while necessary and advisable will in my humble opinion, produce no permanent results. They should be removed to lighten the burden and render other measures more effective, but by this time special and distinctive therapeutic attacks must be made upon the syndrome and its sequelae. The points I wish to make in this cursory paper are:

1. That the physician be a competent *diagnostician* and able to discern the early phases of the syndrome.

2. That a detailed and carefully written *clinical history* must be obtained and consideration given to acute and long continued infections and toxemias as causative factors in the process.

3. That the *causative factors* to be considered are the acute exanthemata, toxemias, etc., in childhood; the chronic focal infections and chronic low grade systemic infections and toxemias at all ages of life's short span.

4. That careful and competent physical, cardio-vascular-renal, neurological, blood serum, laboratory and other tests, examinations and analyses be made, as will *early* in the syndrome detect its presence.

5. That a careful study and synthesis be made of the clinical and laboratory findings for the purpose of determining, not alone the nephro-cardio-vascular state but the patient's functional condition.

6. That *medicines* at all stages do little or no good excepting digitalis, properly applied.

7. That *real therapeutics* lies in the domains of hygiene, diet, exercise, hydrotherapy, electro-therapy, etc.

8. That the *real essential thing, that stands out cameo-like*, is early diagnosis with preventive and reconstructive measures, followed by a life, if possible, that adapts itself to its kidney parenchyma.

RENO-PULMONARY SYNDROME*

By O. O. MILLER, Louisville.

In detailing the pulmonary symptomatology referable to renal disease, it is taken for granted that we are discussing chronic nephritis. There has been no attempt to separate the symptoms associated with chronic parenchymatous nephritis commonly known as large white kidney of autopsy, and characterized during life with marked and obstinate dropsy; and the small white kidney of chronic interstitial nephritis in which there is marked cardio-vascular change and less liability to oedema. Suffice it to say, that those respiratory symptoms associated with hypertension may be assumed to occur in chronic interstitial nephritis, although many of them may and do occur in chronic nephritis, whether of the parenchymatous or interstitial type.

In cases of chronic nephritis, and especially those of long standing, we have certain respiratory symptoms, which while in no way characteristic of renal disease, not infrequently lead us to suspect its presence. Epistaxis is a symptom common to many complaints, but occurring in an elderly person, without apparent cause, should lead us to interrogate the cardio-renal system. Such a nose bleed is indicative of weakening blood vessels and may give warning of an impending apoplexy. Oedema of the larynx is a late manifestation, developing more or less suddenly, and need only be mentioned in passing, as other evidences of the disease may be only too apparent.

Chronic bronchitis or hypostatic bronchitis is a frequent complaint in the less severe cases of chronic renal disease, and is usually evidence in these cases of backward pressure due to an impaired heart and beginning insufficiency of the mitral valve. It is well to regard chronic bronchitis as a symptom only; especially in the aged, in whom it is often observed. It is more pronounced in winter, and is sometimes spoken of as a winter cough. The urine and blood pressure should be carefully investigated in these cases; as bronchitis may be the first subjective symptom of renal disease.

Asthmatic-like attacks are frequent in the course of chronic interstitial nephritis, the so-called asthma and cardiac asthma of the older writers. It is probably a debatable point whether cardio-renal disease may produce true asthmatic seizures; although, Hare is of the opinion that it does. We certainly have paroxysmal attacks of dyspnoea which develop suddenly in these cases; but there is not the characteristic expiratory dyspnoea, which is so well marked in true asthma.

In dyspnoea due to nephritis the difficulty is in getting sufficient air into the lungs, and not in breathing it out. Sudden dyspnoea in an elderly patient, with no history of a similar previous attack in a measure precludes asthma. The presence of a high blood pressure, marked acentuation of the second aortic, and oedema of the extremities give a clue to the diagnosis and reveals the true nature of the dyspnoea. The dyspnoea appears suddenly; is usually worse at night and in the terminal stages may become a true orthopnoea with Cheyne-Stokes breathing, uremic stupor and coma.

Pneumonia is another common complication in chronic nephritis, and in view of this fact, a careful routine study of the blood vessels and urine is warranted. Such a study may disclose the presence of numerous casts not ordinarily associated with pneumonia, and lead us to suspect the presence of cirrhotic kidney.

Due to the increased arterial tension overdistention occurs in the pulmonary capillary circulation, which leads to a pouring out of serum into the alveola and interstitial tissue resulting in oedema of the lungs. This pulmonary oedema may be either acute or chronic, and is usually ushered in as a terminal complication, in which death may supervene in a few hours. There are few cases recorded, however, where there were repeated acute attacks of pulmonary oedema, extending over a number of years, from which the patient recovered; and which were apparently cardio-renal in origin; at least there is no indication to believe that angioneurosis was present. The affection is usually bilateral and more marked over the dependent portions of the lung.

Pleural effusions, not due to an inflammatory process, occur as a result of the same backward pressure, due to cardiac failure; or may supervene as part and parcel of a general oedema, without cardiac failure. In these cases, it is usually bilateral and late in the disease, although in the earlier phases of chronic nephritis we may have unilateral inflammatory pleurisy, with effusion, such as sometimes occurs in gout.

*Read before the Jefferson County Medical Society.

Pericardial effusion, need only be mentioned in passing as another complication that may occur either as part of a general oedema or as an inflammatory process in chronic contracted kidney.

In conclusion, I wish to re-emphasize the importance of interrogating the cardio-renal system in elderly patients, presenting themselves for examination with chronic bronchitis and paroxysmal dyspnoea.

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RENO-OPHTHALMIC SYNDROME*

By CLAUDE T. WOLFE, Louisville.

The fundus of the eye is the only part of the normal body in which an exposed artery, vein and nerve can be seen. The retinal tissue they supply with nourishment and sensation can be studiously observed. On account of the highly organized and easily destructible protoplasm composing retinal elements they react readily to the toxic substances in the circulating blood and degenerate as readily when nourishment is withdrawn. Therefore, in the eyes of nephritics, when changes are present, the ophthalmic picture of the fundi represents the results of toxins or alterations in the walls of the retinal blood vessels. But as these retinal manifestations are grouped principally upon objective findings it is essential for us to base our structure upon clinical types of nephritis. Therefore, broadly speaking, we will classify Bright's disease into two types. In the first the distinctive symptoms are albuminuria and dropsy and in which arteriosclerosis is a secondary symptom, and in the second the exudation of serum is not conspicuous but arteriosclerosis is the predominant factor.

Chronic parenchymatous and chronic interstitial nephritis are often spoken of, but this is a pathological division and would surely confuse us in the study of retinal signs and symptoms which are clear and characteristic in their clinical groups. Likewise, two divisions may be made in our study of the retinal changes that develop in the course of chronic Bright's disease, one in which exudation into the retina is prominent, and another in which it is slight or absent, and in which the paramount feature is the manifestation of arteriosclerosis.

We will now discuss the manifestations of

chronic Bright's disease with understanding as clear as the rather confused state of our knowledge of nephritis allows.

The condition of the retina is one of edema with cloudiness of fundus details, most marked in region of optic nerve which renders its margins and the details of its surface indistinct; lustrous white patches with ill-defined margins arranged around the nerve and about a disc's width from its borders; these patches sometimes coalesce producing the so-called "snow bank appearance," and hemorrhagic spots of various shapes and sizes occur in the same zone. Besides the escape of serum into the retina which is accompanied by the above picture, the plasma of the blood may pass from the vessels and coagulating form white plaques which we find arranged in two plans. In the deep layers of the retina they form stellate lines about the fovea, a picture due to the arrangement of the small blood vessels which converge about the macula but do not invade it. And in the superficial or nerve fiber layer they form along the larger vessels and about the nerve head in formless indefinitely-sized patches. The veins are dark, distended and tortuous, and the arteries are not materially altered in size.

Blurred vision is the only subjective symptom which occurs late in the disease, and both eyes are always affected. Not infrequently the ophthalmologist is consulted for this one symptom and is the first to discover the eye findings of an existing Bright's disease, the patient until then being unaware of any serious organic malady.

It is of diagnostic importance to recognize that the classical picture of stellate exudation at the macula is not necessarily pathognomonic of nephritis. The entire manifestation may be due infrequently to brain tumor, diabetes, syphilis or endarteritis obliterans, and confirmatory evidence is therefore essential before a diagnosis of albuminuric retinitis can be made positively.

Retinitis in Bright's disease occurs at all periods of life; the usual age is between 30 and 60 years. The youngest case reported is by Bull, in a child 5 years of age. Another aged 9 years is reported by deSchweinitz.

As regards sex, retinitis appears to be about twice as frequent among men as among women.

The frequency of retinitis in chronic Bright's disease is rather hard to estimate but the consensus of opinion seems to be that it occurs in about 25 per cent of the cases.

Pregnancy complicated by albuminuric retinitis is of grave import both as to life and vision. Eclampsia frequently follows closely, and the eyes of such women who develop al-

*Read before the Jefferson County Medical Society.

buminuria should be examined carefully for the first evidence of retinitis. In some instances vision is lost in spite of the induction of premature labor, but in many cases both the eye and the renal symptoms subside after this procedure. The exact time for the induction of labor depends on the month of pregnancy, upon the condition of the urine, upon the condition of the retina, and upon the judgment of the obstetrician; and a knowledge of the gravity of retinitis developing during pregnancy therefore is imperative.

In the study of the retinal complications accompanying interstitial nephritis we enter a region rather obscure in that we are not reasonably certain that the exudation into the retina is due directly to the nephritic toxin or to arteriosclerosis. We are justified in inclining to the latter belief mainly because the sclerotic condition of the vessels with the signs of high blood pressure present themselves frequently before there is any discoverable evidence in the urine of nephritis.

Let us then confine ourselves to the study of arteriosclerosis as manifested in the retina, not dismissing, however, the role played by the accompanying nephritis. The symptoms in the retina of this disease are truly characteristic and the possibility of error is minimized as these retinal symptoms are produced by no other disease.

The early signs of retinal arteriosclerosis have been established definitely as follows: Flattening or bending of the veins where they cross or are crossed by the arteries. The veins where the arteries cross them show a slight distention on the distal side, and the arteries by the thickening of their walls hide the veins at the crossing. A corkserew appearance of the terminal arteries about the macula often attended by edema of the fovea and of the nerve head. Small white spots at the macula accompanied by small glistening spots scattered about the retina.

In the early developing of these sclerotic changes in the retinal vessels as phrygmonometrie examination usually will disclose an increase in blood pressure.

The prognostic significance of the exudative retinal manifestations especially those that present the classical arrangements at the macula is indeed grave as most patients die within one or two years of the development of the retinal complications.

The prognostic value of retinal sclerosis, however, is not so generally appreciated. The early manifestations do not offer anything definite in the determination of the longevity of the individual, as they may be only the early signs of general arteriosclerosis or nephritis. However, with these early retinal

symptoms we almost always find some increase in tension in the general circulation. When the retinal sclerosis has advanced so far that emboli, thromboses, or more especially small flame-like hemorrhages along the vessels appear, a development that accompanies severe toxemia and a very high arterial tension, it is apt to be a very fateful warning of approaching uremic coma or cerebral hemorrhage.

While small flame-like hemorrhages do appear along the course of the retinal vessels as a late manifestation they may be present in the early stages of the disease, and their appearance is an indication that arterial tension is high though the vessels may not be seriously sclerosed. A urinary examination will disclose evidence of nephritis not necessarily by the presence of large quantities of albumin as by the presence of granular casts. As these hemorrhages appear and disappear depending upon the amount of uremic toxemia, they may be looked upon as an index to the efficacy of our treatment.

In conclusion, I wish to state that early and frequent ophthalmoscopic examinations in the course of renal or arterial diseases are of inestimable diagnostic and prognostic value in the determination not only of the condition of the kidneys but also of the general circulation.

DISCUSSION:

F. C. Askenstedt: In recent years there have been several attempts at a newer classification of essential renal diseases, the old classification of acute and chronic parenchymatous and interstitial nephritides having been found unsatisfactory. Volhard's classification, which offers a greater correspondence between symptoms and pathology has been generally accepted in Germany and Sweden and has recently been introduced in America. It has taught us, (1) that the quantity of albumin and casts in the urine has no prognostic value; (2) that the presence of red blood cells in the urine is of as great a significance as is the presence of albumin; (3) that eclamptic nephritis is not a form of true uremia; (4) that definite indications for phlebotomy and lumbar puncture.

His classification consists of: **Nephrose**, which is a degenerative, not inflammatory, state. It occurs in infective diseases, as syphilis, diphtheria; in toxic conditions, as pregnancy, or poisoning with corrosive sublimate or oxalic acid. The urine is usually loaded with albumin and casts, yet recovery most frequently takes place. It is divided into three stages, the last of which, if it develops, is marked by a contracted kidney and true uremia. **Glomerulonephritis**, which includes all cases of true nephritis, occurs in scarlet fever and other inflammatory diseases, and

sometimes in pregnancy. It also occurs in three stages, the last, when developing, merging into contracted kidney. Its acute and subacute stages are marked by red cells in the urine. **Sclerosis** or contracted kidney; benign, without uremia; malignant, with true uremia.

True uremia is dependent upon retention within the blood of an excess of effete matter. It is recognized clinically by anorexia, thirst, vomiting, urinous odor of the breath, apathy, increased irritability of the muscles, usually very high blood pressure, later somnolence and coma, maybe pericarditis or enterocolitis without fever. Some cases of less advanced kidney disease present a pseudo-uremia, which seems to be dependent upon an oedema of the brain, and presents a somewhat different symptomatology: headache, increased reflexes, unilateral or bilateral, sometimes even a Babinsky; amaurosis, stiffness of neck, transient paralysis, increased spinal pressure, and increased blood pressure, though this may not exceed 150 mm. This is the so-called eclamptic state, and is best known in connection with pregnancy, puerperal eclampsia. Here lumbar puncture as well as phlebotomy will prove of value. Reduction of the intake of fluids and of salt is, of course, also enjoined.

In the recognition of these various diseases of the kidney the water test is very useful. 1,000 c.c. are taken at 8 a.m. and the urine is collected every hour for four hours and later every three hours during the rest of the day. The quantity of each specimen is measured and its sp. gr. is taken. Normally one-half of the quantity is passed in about two hours and almost all in four hours; the sp. gr. should rise to 1025 or over at 9 p.m. This test demonstrates the capacity of the kidneys to eliminate water, on the one hand, and to increase the concentration of the urine, on the other, thus affording definite indications for dietetic regulation and treatment.

Adolph O. Pfingst: In connection with the ocular symptoms of existing nephritis, we must not only consider the diagnostic value of retinal spots when present, but must also consider the significance of their absence.

While the lustrous white spots observed in the retina are most frequently noted in nephritis they may be present in other diseases, notably in diabetes, syphilis, and in increased intra-cranial pressure from any cause. While the stellate arrangement of the white spots around the macula is most frequently observed in nephritis, it has also been noticed in other diseases, therefore it is necessary to supplement the ocular findings by urinary examination and other tests before making a positive diagnosis.

As to the absence of the retinal spots: I believe the internist sometimes lays too much stress on the absence of retinal symptoms in Bright's disease. When the oculist makes an examina-

tion in a suspected case and no retinal changes are found, the internist often seems disappointed and inclined to doubt the existence of Bright's disease, whereas we know that but one in every three cases of chronic nephritis are complicated with retinal disease.

In this connection I would mention the fact that the retinal changes are not always in keeping with the severity of the renal disease, hence they furnish no index as to the condition of the kidneys. Retinal changes of some magnitude have been observed in cases with little or no apparent renal disease whereas normal retinae often exist in marked cases of renal disease.

The disturbance of ocular function is also not always in keeping with the ophthalmoscopic changes for changes may be quite extensive and yet be associated with little disturbance of function, provided the macular region is not involved. Slight changes involving the macular region may be associated with considerable disturbance of function.

The prognostic significance of retinal disease in nephritis should especially be stressed—most cases of the kind terminating fatally within two years.

Hugh N. Leavell: Any discussion of renal pathology must include consideration of the renal circulation. When one recalls the embryological development of the kidney, how the malpighian tufts are formed and their vascular supply and its method of distribution to the uriniferous tubules, it must be apparent that from beginning to end the circulation must be reckoned with in any case of nephritis regardless of the classification adopted. There is but one source of blood supply to the uriniferous tubules, and that is from the malpighian tufts; the afferent from the malpighian tuft forms a single plexus around each uriniferous tubule, and whether an existing nephritis be interstitial or parenchymatous one must reckon with circulation of the blood.

The nephro-cardio-arterial syndrome is dependent entirely upon pressure exerted within the wall of the kidney. The failure of Edebohl's decapsulation operation in nephritis is easily explained upon anatomic and physiologic findings. As the vessels approach the cortical portion of the kidney they form arches which dip down to form the malpighian tuft, with a single plexus around the uriniferous tubule. Interference with the circulation of blood within the kidney will sooner or later destroy the function of the malpighian tufts. There is a distinct constriction at either extremity of the malpighian body, composed originally of two layers which invaginate in their later histological development. The urine must be "squeezed" through one of these layers before it can enter the uriniferous tubule. Therefore it must be apparent that in either interstitial

or parenchymatous nephritis the circulatory apparatus must be considered.

I agree with Dr. Pope that in the treatment of the nephro-cardio-arterial syndrome digitalis properly used to secure its maximum effect meets all the indications. In the administration of this drug one must reckon with peripheral resistance, with cardiac action, and most of all with the coronary arteries, because upon the latter will depend whether or not myocardial degeneration occurs during the course of nephritis. When the coronary arteries are interfered with the proper amount of blood does not reach the Valsalval sinuses and myocardial degeneration ensues. Digitalis constricts the musculature of the heart and slows its action, the sinuses of Valsalva and the coronary arteries are thus properly filled with blood and the heart muscle adequately nourished. That is one reason why digitalis is indicated in nephritis even when the systolic blood pressure is the highest; it makes no difference if the blood pressure is 200 mm. digitalis will cause recession. This observation may be contrary to the teaching of many text books but it is nevertheless true, for the reason that digitalis permits filling of the coronary arteries thus giving the heart more nourishment and a greater period of rest; it also acts on the vagus nerve thus slowing cardiac action and giving greater nutrition to every portion of the reno-cardio-vascular system. I believe careful study of the circulation will confirm the use of digitalis in all stages of nephritis; it increases pressure within the kidney in the proper way; it stimulates osmotic action as well as the circulatory apparatus, because it increases nutrition of the tissues, helping to increase their physiological activities.

Curran Pope, closing: In the treatment of the nephro-cardio-arterial syndrome we try to get the patient in the best possible physical condition; and to accomplish this I personally depend largely upon baths, massage, rest, exercise, and various forms of electro-therapy. However, none of these measures will be productive of maximum benefit unless the dietetic intake is carefully regulated and adapted to the renal output, which can be determined only by experimentation.

My observation of the treatment instituted by the average physician in cases of this kind has been that the patient is instructed "to get along on a minimum diet," which is diametrically opposed to the plan I personally follow. As soon as the patient has been gotten into anything like a functional condition, I give him the maximum dietary that his kidney parenchyma can withstand; remembering that in addition to considering the condition of the heart, kidneys and blood vessels, the individual must be adequately nourished, and that all his organs and tissues are closely interrelated in functional mechanism. When, by careful study, repeated examinations and tests, individual tolerance has been definite-

ly established, then I say "here are the therapeutic and dietary formulæ by which you must live."

With regard to the administration of digitalis: I personally reserve the application of this drug until after the syndrome has developed. The effect of digitalis may be supplemented in many ways; its action may be increased by the application of ice to the precordium and also by sweating. The nephro-cardio-arterial subject cannot be maintained in comfort unless the maximum circulatory effects are secured, which of course means equalization of the circulation in its distribution and pressure.

The point I especially desire to make is: that in these cases we are not dealing merely with the written term nephro-cardio-arterial syndrome, we are dealing with human beings who vary widely in their physical, cardiac, renal, neural and psychic make up, and in such cases no text book law can compare with experience and common sense based upon careful examination and observation and this is in my opinion the only way to handle these cases.

Anaphylactic Symptoms After Reinjection of Antiserums.—Ustvedt studied the problems of serum sickness and anaphylactic shock on the basis of an investigation of 1669 patients treated with diphtheria antitoxin (horse serum), 1589 having received no previous serum treatment. Of these 1589, 35 per cent developed serum sickness, most of them on the eighth or ninth day. Of 80 previously treated with serum, 77.5 per cent developed serum sickness, usually between the sixth and eighth day. Of 560 persons not previously injected, 35 per cent had the eruption after the tenth day. If in patients previously treated with the serum no rash occurs within ten days, no serum illness is likely to occur. A preliminary test subcutaneous injection of 0.5 c.c. has the advantage of showing whether the person in question is hypersensitive to horse serum or not so that precautions may be taken, but it does not ward off serum sickness. This developed in 75 per cent of the 68 thus treated; but 91.1 per cent of those not given the preliminary injection developed it. He never gives a new and unknown patient the first injection intravenously but intramuscularly. If the case is a serious one, he gives an intravenous dose some hours later.

Tuberculosis Stenosis of the Intestine.—The multiple stenosis of the small intestine in the girl of 16 caused periodical violent pains in the region around the umbilicus, with vomiting. After four years of this, the girl died during resection of the tuberculous intestine. The strictures were of fibrous nature.

CARCINOMA IN THE CERVICAL STUMP
AFTER SUPRA-VAGINAL HYSTEREC-
TOMY: REPORT OF THREE CASES:
REMARKS UPON TREATMENT*

By LOUIS FRANK, Louisville.

It has been my fortune to have seen within the last year three cases of proven carcinoma of the cervical stump subsequent to supra-vaginal hysterectomy for uterine fibromyomata. We believe there have occurred more cases of this kind than have been reported in the literature that they have either passed unrecognized, have been deemed unworthy of notice, or have occurred in the practice of surgeons who for reasons best known to themselves have not reported them. In any event, until about six years ago the subject received but little attention.

A most careful and thorough search of the literature since 1913, reveals only three contributions to the subject. The first was by Leonard, of Johns-Hopkins, who reviewed all the supra-vaginal hysterectomies performed in that hospital since its foundation, and was able to find only two cases. From available literature he collected thirty-three others, making a total of thirty-five recorded cases. In many instances probably the cervical carcinoma existed at the time supra-vaginal hysterectomy was performed and was overlooked. The three cases which have come under our observation will be reported briefly.

(1) Mrs. N. J., aged 35, referred by Dr. C. W. Dowden, October 12, 1918. The patient had one child, now fourteen years old, and two abortions. Family history negative for malignancy, and there was nothing of interest in her previous personal history excepting the supra-vaginal hysterectomy and bilateral oophorectomy one year prior to coming under our observation. The patient did not know the nature of the pathology for which the operation was performed, and we were unable to ascertain the facts. However, since the operation there had been frequent almost continuous hemorrhage from the vagina which gave us the impression that cervical disease existed at the time of the previous operation, though when she came under our observation it had progressed to only a slight degree. She had moderate leucorrhea with slight odor. She said she did not believe she had lost weight or strength. She complained of constant pain in the left adnexal region, but had not been confined to bed. All symptoms were aggravated by unusual activity.

The physical examination was negative

throughout except for pain on palpation in left adnexal region and sanguineous vaginal discharge. Upon introducing a speculum a small ulcerated nodule was noted on the cervix which bled readily upon manipulation and which upon section proved to be an adeno-carcinoma. A probe passed two and a half inches into the cervix toward the left side.

(2) Mrs. A. H., aged 50 years, referred by Dr. L. S. McMurtry, June 30, 1919. The patient had two children and there had been two abortions. One daughter had a fibroid tumor of the uterus. Supra-vaginal hysterectomy eight years previously for uterine fibromyoma. She stated that in May, 1919, she had slight bleeding from the vagina, and later several severe hemorrhages. About ten days before coming under observation bleeding had recurred and had continued until we saw her. There was slight pollakiuria but no dysuria and no pulmonary symptoms. Since onset of present complaint she had complained of slight pain in her back principally over the third and fourth lumbar vertebrae. No pain in legs or thighs.

Physical examination revealed a hard, indurated mass in the cervix extending into the left broad ligament. The cervix was much thickened, indurated and fixed. Diagnosis, clinically and microscopically, carcinoma of the cervix uteri.

(3) Mrs. W., aged 50 years, referred by Dr. B. M. Taylor, of Greensburg, Ky., August 18, 1919. She had no children and there had been no abortions. There was nothing of interest in the family history. Previous personal history: patient operated upon for uterine fibromyoma twenty years ago. She has had "rheumatism" even since the operation; an attack of influenza in December, 1918. In February, 1919, she had a rather profuse hemorrhage from the vagina lasting two days which was finally controlled. At various times since then she has had continuous slight bleeding for several days and occasionally profuse hemorrhages. She had a watery, pale discharge with foul odor. No pain in the thighs, some pain in hips, but the patient said she had suffered with this for years. No bladder nor other symptoms.

Physical examination revealed a mass or plug of tissue filling the cervical lumen which bled easily when touched. There was apparently no extension into the broad ligament. The diagnosis clinically and microscopically was adeno-carcinoma of the cervix uteri.

A review of the cases of cervical carcinoma following supra-vaginal hysterectomy collected by Leonard shows that one reported by Riehelot was of questionable duration; one

*Read before the Jefferson County Medical Society.

developed eighteen years after operation; four within seven years; one within six years; one within five years; three within four years; two within three years; six between one and two years; one within two and a half years; seven within less than one year; six within six months, two of the latter presenting within one month after operation.

Worrall, in the *Medical Journal of Australia* for June 22, 1917, reports three cases which occurred in his own practice, and in a debate before the Royal Society of England similar cases were mentioned following subtotal hysterectomy for fibromyomata uteri. In 1917, Edgar Vander Veer, of Albany, N. Y., reported two cases, one occurring in a widow ten years and the other in a married woman two years after hysterectomy for fibromyomata. He also reports a case given him in a personal communication by Dr. Leonard Freeman, of Denver, Colo., in a married woman who was subjected to supra-vaginal hysterectomy for fibromyoma of the uterus in December, 1913. She returned in February, 1914, on account of bleeding, only three months after operation. On May 15, 1917, or about three years later, the cervix was removed for frank carcinoma. In his paper he further mentions five cases communicated by Dr. J. F. Baldwin, of Columbus, Ohio, none of the details being given, making forty-six cases found in literature. These with the three we had seen at the time these notes were made makes a total of forty-nine cases. Since these notes were made we have had under observation in the Louisville Public Hospital a woman operated upon secondarily by Dr. J. W. Price, Jr., for post-operative hernia. She had a carcinoma of the cervix subsequent to supra-vaginal hysterectomy for a uterine tumor which was diagnosed in the pathological laboratory as non-malignant.

Among 3,786 cases of myomata uteri collected by Noble and Cullen, there were 124 cases of cancer or slightly over 3 per cent. Winter mentions 1270 cases of fibromyomata uteri with cancer of the cervix in twenty-five or about two per cent. From our search of literature in connection with the preparation of these notes we believe in approximately two and one-half to three percent of cases fibromyomata uteri are complicated sooner or later by carcinoma. We do not mean to say, however, that carcinoma of the cervical stump subsequent to supra-vaginal hysterectomy originated from fibromyoma of the uterus, the uterine tumor probably had nothing whatsoever to do with the occurrence of the cervical carcinoma the latter being merely coexistent. This is a high incidence as we would hardly expect to find two or three per

cent of carcinoma present in women of myomatous age who come under observation because of other pathology.

As to the treatment of these cases: The practice heretofore has been to perform radical operation for removal of the carcinomatous cervix, but we have here the same questions to contend with as in primary operation for removal of the uterus. Just what the results have been in these cases none of the authors say. In other words, we have been unable to find what the mortality is in this class of cases in contradistinction to primary carcinoma of the cervix in which pan-hysterectomy, the Wertheim or any other type of operation has been performed for its cure. Whether or not the mortality is greater or less we are unable to say, but in the most of these cases the cervix has been removed. This may present some difficulty if the operator is not familiar with the type of operation required, and it becomes more difficult if infection has ensued, and for many other reasons.

The three cases we have reported were all treated by the application of radium. The first patient, Mrs. N. J., has had four treatments with radium. The first application was twelve hours on October 12, 1918, the second on May 10, 1919, the third on June 27, and the fourth on July 26, at which time a note was made that the cervix was completely movable and no evidence of the pre-existing disease was found. She returned for observation on October 19, 1919, and there was still no evidence of disease, complete local healing having occurred. I may say that these patients are not completely dismissed, they are kept under observation just as we do patients operated upon for carcinoma in any other region, until they have passed the five-year period.

The second patient was in a very serious condition when first seen. She had bled profusely and we thought she was going to die. She was given a twenty-four-hour treatment with radium on June 20, 1919 and another on August 12, at which time there was no induration on the right side. On the left side there was some thickening which extended to the pelvic wall. Locally there was slight sloughing in the vagina, otherwise the vagina was normal. On September 12, the third treatment was given, and a note was then made that she was much improved with no evidence of disease other than slight induration toward the left side.

The third patient was given a twenty-four-hour treatment on August 18, 1919. She returned October 2, with the cervix perfectly movable. There was some thickening in the

right utero-sacral ligament, but the cervix was apparently normal and healed. We believe in cases one and three we will get an absolute cure. What the result will be in the second case we have as yet no opinion.

From February 13, 1917, to October 13, 1919, a period of thirty-two months, exclusive of the three cases just reported, we have treated thirty-eight cases of carcinoma of the cervix with radium. We have divided these cases into several groups. For instance, we find in the series eight which probably would have been classed as operable, while thirty were absolutely inoperable, in fact quite a number of them had been curetted and cauterized; but all of these latter thirty had been rejected for any radical procedure and many of them had been refused any operative procedure whatsoever. In this latter group we place, for instance, two patient referred by Dr. H. H. Grant. One of them had been cauterized and was looked upon as absolutely incurable, but after the third treatment remained apparently well until the present time, almost two years later. The other patient seen March 7, 1918, had been curetted and cauterized two weeks previously. She was given one treatment of twenty-four hours duration and did not return for further observation. We have learned since that she had died.

Of these thirty-eight patients we have positive knowledge of ten who have died and one who is now dying. There are four others who are not well and possibly may never be, though they now show no evidence of local disease, the cervix has healed completely and there is no infiltration whatsoever.

In the series there are eighteen patients who are absolutely well, though they are still under observation and will remain so for two or three years longer. There has been cessation of the discharge and local healing, but there is still some infiltration of the recto-sacral and utero-sacral ligaments. This patient will probably die ultimately from internal metastasis. She was inoperable when first seen, having a tumor the size of a hen's egg which had begun to ulcerate.

As a rule in treating these cases we have used a twenty-four-hour exposure. The radium is screened with rubber, placed in a capsule, and then introduced into the growth. We think probably massive dosage for a short period a better method, though with smaller dosage repeated or extended over a longer period practically the same results can be obtained.

We exhibit some of the needles and applicators used in radium therapy, also screens, etc., which may be of some interest.

DISCUSSION:

L. S. McMurtry: In considering the frequency of carcinoma in the cervical stump following supra-vaginal hysterectomy it must be remembered that this is a very common operation. Fibromyomata of the uterus are among the most common of all diseases of the pelvic organs; they are especially common in the negro race and in every public hospital supra-vaginal hysterectomy is an operation which is frequently performed; and when you consider that the operation is equally popular in every other country you must recognize the enormous number of these cases. A very large number are neither reported nor tabulated. Much surgery is being done in small hospitals throughout the country where they are careless about statistical records and case reports. When you take into consideration the frequency of uterine fibromyomata, the particularly successful character and popularity of supra-vaginal hysterectomy and the large number of such operations being performed, then make a systematic search of the literature of the world and find only forty-nine cases of cervical carcinoma recorded subsequent to the operation, it makes a very small percentage for the disease. There is also something about the individual which tends to lessen the frequency of carcinoma of the cervix uteri. Cervical carcinoma occurs as a rule in women who have borne many children. you will not see once in ten years a carcinoma of the vaginal cervix, and if you do ninety-nine times out of one hundred it will be a cervix that has been operated upon for dilatation or something else. The vaginal cervix is rarely the site of carcinoma. The typical individual for development of carcinoma of the cervix uteri is the woman who has borne several children and the time at which it occurs is during that degenerative period between forty-five and fifty years. Uterine fibromyomata occur at all ages, and particularly in sterile women. When supra-vaginal hysterectomy is performed it leaves the cervix probably less prone to carcinoma than would obtain than if the uterus was present and actively functioning. Therefore, we are justified in saying that carcinoma of the cervix following supra-vaginal hysterectomy occurs rarely, and I am inclined to believe Dr. Frank's estimate makes the percentage a little excessive. I have performed several hundred supra-vaginal hysterectomies for fibromyomata and have seen but two cases of carcinoma of the cervical stump, and the character of my practice has made it possible for me to keep in touch with the patients for a number of years. So much for the incidence of the disease.

The next feature of interest is the treatment. If the patient could be seen early, in the very inception of the disease, when the neoplasm exists merely as a small tubercle, and if the cer-

vix could be excised at that stage, I think the chance for ultimate cure would be better than when a functioning uterus is present; but the patient is rarely seen at that stage of the disease. The patient I referred to Dr. Frank was operated upon eight years previously for fibromyoma by supra-vaginal hysterectomy. When she returned a carcinoma had developed in the cervical stump. All the debris was curetted away and the cervical stump cauterized to stop the hemorrhage. I realized at the time that the case was inoperable. In that case radium has produced a wonderful result. There was considerable induration in the broad ligament on the left side, and the application of radium was followed by immediate improvement which has continued. There is no doubt that radium is a wonderful therapeutic agent. It has now passed beyond the stage of experimentation, and while we have yet to learn much regarding its use and limitations, there is no doubt that in this particular class of cases it does something which cannot be accomplished any other way. Dr. Frank has given us an excellent exposition of present knowledge. He has reported thirty-eight cases in which radium was used; a number of them died; some improved; a number have become apparently well. Of the thirty-eight cases, eighteen seem to have recovered. If there had been only one it would have been worth while, because this agent is used in a class of cases where surgery cannot be applied with any prospect of benefit.

E. S. Allen: In many instances probably cervical carcinoma noted after hysterectomy for fibromyomata of the uterus is a coincidental condition, and careful examination of the cervix at the time of the operation would have disclosed an ulcer which in my opinion constituted the so-called cancerous stage. An ulcerated cervix with constant irritation would have a tendency to cause retrograde karyokinesis of the tissue cells and section of the cervical lesion would show dissemination of the cells into the surrounding tissue or at least filling the acini of the glands.

It would be a good idea, when operating upon a patient where the abdomen has to be opened for pelvic pathology, to make a careful examination of the cervix. When the cervix is found ulcerated a pan-hysterectomy should be considered, or as a prophylactic measure where subtotal hysterectomy is performed the entire cervical mucosa may be removed. This can be accomplished without increasing the mortality.

J. W. Price, Jr.: Dr. Frank mentioned a patient who was referred to our service and who had been operated upon in February, 1919, by another surgeon for uterine fibromyoma by the supra-vaginal operation. I was asked to see the patient to determine whether anything could

be done for relief of a large post-operative hernia. Examination revealed that she had carcinoma of the cervical stump. A section was removed and submitted to the pathological laboratory where the diagnosis was confirmed by Dr. Stuart Graves.

I repaired the ventral hernia and at that time extensive intra-abdominal adhesions were found together with a tumor which entirely filled the pelvic cavity. The case at the present time is absolutely inoperable and I think has passed beyond the stage where radium would even be of benefit.

In selecting cases for treatment, and in considering results, we must not expect too much of any method. While surgery may afford the patient temporary relief in extensive carcinomatous development, it will not effect a cure. On the other hand, where the tumor is purely local if radical operation is performed we have reason for believing that the patient may be cured or at least have no recurrence for many years. In the cases treated with radium Dr. Frank has not claimed too much and has presented the subject in a way that appeals to me very much, i.e., many of his cases were incurable when they came under his observation and radium was used to give the patient whatever benefit might occur. The results he has reported from the use of radium are certainly better than could have been secured from surgery or the use of the cautery, and I believe radium should be used in the type of cases he has mentioned.

C. H. Harris: In closing the discussion I wish Dr. Frank would tell us something about the physical characteristics of radium. My understanding is that it acts upon nothing but pathological tissue.

I remember reading in the Journal of the American Medical Association recently that an institution as large as the University of California had in its possession only 250 mgm., of radium. It seems that nearly everybody in this locality is able to secure radium, and I would like to have some information as to where it can be obtained. I would also like to know something more about its physical characteristics.

Louis Frank, closing: I doubt whether carcinoma developing in the cervical stump subsequent to supra-vaginal hysterectomy for fibromyoma of the uterus is ever due to degenerative changes. In the majority of instances the cervical disease is probably coexistent with that of the uterus. Where carcinoma of the body of the uterus is found coexisting with fibromyoma degenerative changes may play a part. We did not discuss carcinoma of the corpus uteri in the paper. The facts must be remembered, however, that carcinoma may be found in connection with fibromyomata of the uterus with no involvement of the cervix; that occasionally there

may be proliferation of cancer cells from the endometrium to the cervix; that possibly the uterine fibromyoma may have something to do with development of cancer cells in the endometrium and extension to the cervix; but this would be difficult to prove. It is quite remarkable that there should be such a high percentage of cases of cervical carcinoma after supra-vaginal hysterectomy for fibromyomata. The literature which I cited had reference to carcinoma of the cervix and not of the body of the uterus.

I believe we could probably prevent the recurrence of cervical carcinoma by following the plan of procedure suggested by Dr. Howard A. Kelly and which has been mentioned tonight by Dr. Allen, i.e., doing a subtotal hysterectomy with removal of the cervical mucosa without removing the cervix itself. If we take into consideration the comparative mortality of supra-vaginal versus pan-hysterectomy, I can see no reason for advocating the latter operation. In over one hundred consecutive cases coming under my observation there has been only one fatality following supra-vaginal hysterectomy, and I know the mortality has been greater than that from pan-hysterectomy. Therefore, taking my individual experience as a basis there is no argument in favor of changing the method of procedure. I do not believe we are justified in adding to the mortality purely for the purpose of avoiding the possibility of carcinoma of the cervix.

As to the method of treatment mentioned in my paper: I have some rather strong convictions which I am not yet ready to place upon record. It will take some time for my opinion to become more firmly fixed as to what can be accomplished by both radium and radical surgery in carcinoma of the cervix uteri. We must bear in mind that the vast majority of the patients who come for radium treatment are absolutely inoperable so far as radical surgery is concerned. We must also remember that in Wertheim's clinic only fifty per cent of the patients who present are operated upon—this is very significant. It seems to me, looking at the matter from a rational standpoint, without any reference to what I may or may not believe, that if radium will produce a favorable effect in delayed carcinoma—which has passed beyond the period for operation—that certainly early cases should be susceptible of much better results. This is a point which must always be considered. We have treated a few early cases with radium and have advised radium in others for certain reasons in preference to hysterectomy. In the cases we have operated upon during late years we have done the Wertheim operation removing all the pelvic and iliac lymph glands. This is an operation of some magnitude and the primary mortality is by no means small. While the results have been better than formerly secured by less extensive methods, only a few of

the patients have now lived beyond the five-year period; and I cannot say that the results were any better, taking everything into consideration, than we have secured by the radium treatment.

In our radium cases one of the difficulties we have encountered in certain instances is to induce the patient to return for further treatment. For instance, I recall a woman referred by Dr. Woodward who had been refused operation by several surgeons. She was then taking large doses of morphine. We gave her one radium treatment. She quit morphine before leaving the hospital and she had no further hemorrhage. We saw her a month or six weeks afterward on the street on her way to a picture show; she refused to report for further examination and said she was well. This woman we have been unable to follow, but believe she has since died. We have had several cases not included in this report where cure was apparently complete insofar as the physical status of the patient was concerned; that is, the malodorous discharge, the hemorrhage, and all other disagreeable symptoms had absolutely ceased, yet they died from internal metastasis. Some of these patients had been addicted to the use of morphine, this was discontinued after radium treatment, and death occurred painlessly in the majority of instances. If this were the only thing, I think radium would certainly be worth while.

It may be of historical interest to observe in this connection that radium was not really discovered by Madame Curie, it was merely isolated as an element by her. Radium was known as early as 1850, as a compound, and some of its characteristics were described by its discoverer; but experimentation with it was abandoned on account of the dangers incident to handling it, etc.

Contrary to existing beliefs radium acts upon all body tissues with which it comes into contact; it will burn normal as well as pathological tissue. However, carcinoma cells are more susceptible to the action of certain actinic rays, whether produced by radium, the roentgen-ray, or a hot iron, than normal cells are. Normal tissue cells will probably withstand heat of 120 degrees, whereas carcinoma cells subjected to heat of 114 degrees to 115 degrees begin to undergo degenerative change. Carcinoma cells are parasitic in character and are more susceptible to the action of radium than normal cells.

I may add that in certain types of sarcoma the most remarkable results are obtained from the application of radium. This is also true about epitheliomata involving the face. Its action in these cases is absolutely phenomenal. We now have under treatment a patient with long-standing sarcoma involving the bone, but what the result is going to be I do not know. We saw a woman with Dr. Owen eighteen months ago who had a

tremendous sarcoma of the femur. She was refused operative intervention; it was a foregone conclusion that she would die; and, of course, we could promise her nothing. We gave her three or four radium treatments, and while her knee joint has been completely destroyed the tumor has entirely disappeared. The diameter of the leg at the site of the growth when the patient came under observation was twenty-one inches; the diameter of the leg at present corresponds to that of the opposite side—about thirteen inches. The tumor practically disappeared within two months. Another patient, a gentleman 65 years old, was treated for subperitoneal sarcoma two and a half years ago and has had no return to date. These cases are merely mentioned to show the tremendous possibilities of radium.

AN UNUSUAL CASE OF TUBERCULOSIS.

By O. R. STUTEVILLE, Big Clifty.

I desire to report an unusual case of pulmonary tuberculosis in a child eleven months old, which was confirmed by laboratory findings. But for the following circumstances I should in all probability have diagnosed the case as bronchopneumonia.

There was a history of exposure to pertussis, but seeing the child only once, and learning that it, with its parents, had alternately spent a week first with the paternal grandmother, who had tuberculosis, and with the maternal grandfather who recently died with the disease, I thought the child surely had all the opportunity necessary for contracting the malady, the bronchial mucosa being in ideal condition to receive the tubercle bacilli. A great aunt of the baby also died of tuberculosis a few years ago.

After seeing the child once, I was called away on a business trip and upon my return learned the child had died.

The examination of the sputum by the laboratories of the State Board of Health showed the presence of tubercle bacillus.

Surgical Treatment of Intestinal Tuberculosis.

—The two chief contraindications to operation mentioned by Archibald are extensive and progressive pulmonary involvement and extensive disease in the small bowel. The most promising cases for operation he says are those in which physical examination and the roentgen ray combine to indicate a localization of the disease to the cecum and the right colon, while at the same time the lungs are but slightly affected and the patient is in good general condition. The operative procedure to be adopted under varying circumstances is discussed.

TRIFACIAL NEURALGIA; SYMPTOMATOLOGY AND TREATMENT*

By L. WALLACE FRANK, Louisville.

The usual conception of neuralgia is that of "pain in the face." In this paper the ordinary types of so-called neuralgia will not be considered, for in the majority of such cases pain is caused by disease involving the teeth, alveoli, nose or accessory sinuses, and consequently cannot be properly classified as neuralgia. True trifacial neuralgia, or the so-called *tic douloureux*, is a distinct entity which is diagnosed entirely by its symptomatology, as the physical finding in most cases are negative. The malady as a rule appears during the latter half of life and has consequently been referred to as a disease of the "degenerative period of life." While the onset may be during the second or third decade, Patriek's analysis of two hundred cases shows that ninety-three per cent developed in the fourth decade or later.

Trifacial neuralgia is characterized by pain along the distribution of one or more branches of the trigeminal nerve and more frequently involved the right than the left side, the ratio being approximately two to one. This fact cannot be explained and is simply the result of observation in a large number of cases. Very rarely the disease is bilateral. Both sexes are about equally affected and there seem to be no predisposing factors in causation of the disease. Head states that the patients "are in no sense of the word neurotic," whereas Oppenheim, Grasset and others are of the opinion that a "neurasthenic" disposition plays an important role in the etiology. We are inclined to agree with the statement of Head, as few of the patients coming under our observation have revealed any neurotic tendencies.

As to the nerve branches involved: It is the common conception and teaching that pain most frequently involves the supraorbital branch. This, however, is erroneous. As a result of our observations we are of the opinion that the pain is more often located in the second and third divisions of the nerve. Never have we seen the ophthalmic division alone the site of pain, i. e., without involvement of the second division. Based on the study of his cases Patriek concludes, "that pain limited to the supraorbital region probably is not neuralgia at all."

As to which of the lower two divisions is more commonly the site of pain we cannot say. Some observers claim the mandibular

*Read before the Louisville Medico-Chirurgical Society.

branch is more frequently involved, while others state the reverse. Not infrequently two branches are affected simultaneously. When this occurs the pain is always in adjoining branches. Never have we seen the first and third divisions implicated unless the second was also involved.

Opinions vary as to the cause of trifacial neuralgia. Frazier believes it is due to primary sclerosis of the gasserian ganglion. Beckman thought the disease began as an infection or neuritis occurring primarily in the peripheral branches and later extending to the ganglion. This view is strengthened by the fact that early in the disease excision of the branch involved brings relief temporarily.

Certainly if the disease began in the ganglion it would be difficult to understand how excision of a peripheral branch could relieve the pain. Nevertheless, Wilson, of the Mayo Clinic, found marked inflammation present in six ganglia removed at operation. These cases may have been of long-standing, however, and the inflammatory changes may have had their origin primarily in the periphery.

As previously stated, trifacial neuralgia, or *tic douloureux*, is characterized solely by a subjective symptom, viz, pain. The pain is essentially of short duration. Beckman has stated that a continuous ache or throb is not trifacial neuralgia. The pain of this disease is variously described as shooting, stabbing, cutting, burning, etc., or, as one patient said, it felt as though lightning was flashing in his face. Pain appears in definite attacks with well-marked intervals between attacks. In the early stages the periods of remission may be of several months or years duration. Later pain recurs, the paroxysms become more severe, and the intervals between attacks shorten as the case progresses.

During an impending attack any stimulus may induce a severe paroxysm of pain. Eating, drinking, swallowing, exposure to draft, or the slightest touch, may cause the most intense suffering. Consequently during an attack these unfortunates cannot bathe the face or use a tooth brush, and not infrequently refuse to eat for fear of causing pain to recur. We may be relatively certain that a patient who will wash his face or permit liniments to be applied is not suffering from trifacial neuralgia.

There are certain areas the irritation of which is apt to precipitate a paroxysm of pain. To these areas Patrick has given the name "dolor genetic zones." Such an area or point may be small; it may be limited to one tooth. As a rule these zones are located about the alae of the nose or the angles of the mouth. The fact that such points are

not infrequently located in the teeth has been the cause of extraction of thousands of perfectly sound teeth. In many patients coming under our observation all the teeth had been extracted and those who had not reached this unfortunate state had been treated by honest dentists who had refused to remove sound teeth. Extraction of one tooth may bring temporary relief; soon another must be removed and so on until all are extracted; but the pain continues just the same.

Patients suffering from trifacial neuralgia are usually emaciated and poorly nourished; most of them cannot eat solid foods for their teeth have been removed and on account of the pain a plate cannot be worn. Consequently, their diet is limited to liquids or soft foods. Others are afraid to eat for fear of precipitating a paroxysm. I recall one patient, a female of 65, who was toothless and had subsisted solely upon liquids for five years. In her case we were forced to practice alcohol injection of the nerve roots as a preliminary step in order "to feed her up," and get her into physical condition to undergo radical operative treatment.

In the treatment of trifacial neuralgia drugs have no place. In the early stages they may be tried but in the majority of instances will be found useless. It is true, however, that pain may be controlled by administration of the stronger sedatives. In this disease, perhaps more than any other, care must be exercised that the patient does not become an addict to morphine or some of its derivatives. Should milder sedatives fail to bring relief we must then resort to surgical treatment. And at this point I wish to emphasize the statement that surgery should not be postponed until the patient is broken in health and morale through weeks or months of pain, suffering and lack of proper nourishment.

There are at present three methods in vogue by which these unfortunate patients may be successfully treated. In two of these the relief from pain is only temporary; in the other it is permanent. In our opinion the method of choice is physiological extirpation of the gasserian ganglion. However, at times there are definite contra-indications to the procedure, and we must then choose between avulsion of the peripheral nerve involved and alcohol injection of the great nerve trunks at the base of the skull.

The performance of avulsion of the peripheral nerve is simple and easily accomplished. It consists in making an incision over the exit of the nerve from the skull exposing the nerve thoroughly and gradually "twisting it out." In patients suffering from pain in the infra-dental distribution an incision is made over

the angle of the mandible. The fibers of the masseter muscle are separated and the bone exposed. With a small trephine a bone-button is removed at the junction of the descending and horizontal rami and the nerve exposed as it lies in the infradental canal. It is then grasped with forceps and gradually "twisted out," removing both peripheral and central extensions.

The great objection to this method (peripheral avulsion) is that relief is only temporary, although as a rule it is somewhat longer in duration than that obtained by alcohol injection. In our opinion this plan is especially indicated where the ophthalmic division is involved and where there are contra-indications to the major operation. In all cases where avulsion of a peripheral nerve is practiced the bony canal from which the nerve is removed should be well-plugged either with bone or metal screws. The peripheral nerves have the ability to regenerate and do so unless prevented by blocking the canal.

In 1900 Schlosser showed that following the injection of eighty per cent alcohol into a sensory nerve root there was a brief period of pain followed by numbness and anesthesia; then, queerly enough, normal sensation returned but no pain. As Killiani remarks, in referring to the deep injection method, "this in a few words is the *raison d'être* of the procedure." Schlosser, Levy and Bedouin and Oswalt devised methods by which alcohol could with relative certainty be injected into the large nerve trunks as they emerge from the base of the skull.

Although the first division of the trigeminal nerve may be safely injected, we have never done so. In cases where this division is involved we prefer the peripheral operation. The dangers of injecting this branch are great owing to its proximity to the large blood vessels, the motor nerves to the eye and optic nerve.

The technique of injection of the second or maxillary division is as follows: A point is selected about 1 cm., below the zygoma and one-half cm., behind a line drawn perpendicularly from the orbital process of the malar bone. The needle is inserted at this point and directed upward and slightly backward for a distance of five cm., at which depth one should strike the nerve. In cases where the inter-zygomatic measurement is decidedly greater than normal it may be necessary to insert the needle a little further.

In injecting the third division a point is chosen just below the zygoma and two and one-half cm., in front of its root. The needle is entered at this point and pushed directly inward. At a distance of four cm., one should

penetrate the mandibular branch as it emerges from the foramen ovale. As in the previous case it may be necessary to insert the needle a little further in some instances. At times we may find that the point of the needle meets with bony obstruction. If such happens we know that it impinges upon the external pterygoid plate. The needle is then withdrawn a little and the point directed more posteriorly.

In the injection of alcohol into the nerves it is unnecessary to administer an anesthetic. When the nerve is reached the patient complains of pain in the peripheral distribution of that branch. The stylet of the needle is then withdrawn and the alcohol injected. As a result of experience we can tell whether or not the injection is being made directly into the nerve trunk by the force required to make the injection. Anesthesia of the periphery should develop immediately and we always test for this before withdrawing the needle.

This method of treatment is very satisfactory, the only objection being that the relief is temporary. The average duration of the relief from pain is about nine months. Killiani reports that there have been no recurrences in forty-two per cent of one hundred and ninety cases after two years. This, however, is exceptional. The greatest advantage of the method is that it is without danger and may be repeated indefinitely.

There are certain complications which may develop following this method of treatment. They are: keratitis, seen especially after injection of the ophthalmic or maxillary division; paralysis of the sixth nerve; hematoma and ecchymosis; stiff jaw, and occasionally the injection of alcohol into the naso-pharynx.

Hartell devised a technique by which alcohol could be injected directly into the gasserian ganglion. However, as corneal ulceration developed in twenty-five per cent of his first series of cases we have made no effort to adopt this method.

Operation upon the gasserian ganglion is the only method which offers permanent cure. Formerly it was the custom to perform either a partial or complete gangliectomy. In 1898, Spiller devised a method for physiological extirpation of the ganglion by dividing its sensory root. He found there was no regeneration of the root after division. In 1900, Frazier began using this method and has continued to do so until the present time. Division of the sensory root is technically easier and is followed by decidedly lower mortality than partial or complete gangliectomy.

Recently Adson has modified Frazier's technique by dividing the nerve with a sharp instrument, whereas Frazier performed avul-

sion of the sensory root. A certain number of patients develop facial palsy following avulsion of the sensory root of the gasserian ganglion. Adson is of the opinion this is due to trauma of the pons and subsequent degeneration caused by tearing the sensory root away from that structure. By incising the root he has found there have developed no instances of facial palsy, although the number of his cases is not sufficiently large to conclude definitely that this complication will be obviated by his modification.

The method of dividing the sensory root of the fifth nerve is as follows: A question-mark-shaped incision is made in the temporal region well within the hair line having as its base the zygoma the convexity of the curve being directed posteriorly. The skin is then reflected forward. A reverse incision is made through the temporal fascia and this reflected posteriorly. The fibers of the temporal muscle are separated and the skull exposed. With a Hudson burr and rongeur forceps an opening an inch and a quarter in diameter is then made through the skull the lower edge being as near the base as possible. The dura is gradually separated from the base of the skull and elevated, and soon the foramen spinosum and the middle meningeal artery come into view. This vessel is ligated and divided and separation of the dura inward continued until the third division of the nerve is exposed as it passes through the foramen ovale. The dura over this branch is incised and gradually stripped from the ganglion exposing the sensory root. The root is then carefully isolated and elevated on a hook and divided either with sharp curved bistoury or torn through with the hook as the operator prefers. The dura is then allowed to recede into place and the incision is closed. During closure the patient need not be given any anesthetic as there is no pain whatever since the nerve supply to this region has been severed.

One of the sequelae of this operation is paralysis of the muscles of mastication upon the operated side. This is rather common and due to inability to separate the motor from the sensory root of the fifth nerve. However, it is not a serious complication and as a rule the patient is so delighted at the relief from pain that he cares nothing for the slight muscular stiffness which follows. A more serious complication is trophic keratitis. This must be carefully watched for and treated immediately when recognized. In most cases the ulcer heals promptly, but occasionally it may be necessary to suture the lids for a varying length of time to produce a cure of the ulcer.

This operation offers a permanent cure and we advise that patients in good physical condition be treated in this way. However, we explain all the facts to them and then permit them to decide which method they prefer.

DISCUSSION:

John W. Price, Jr.: I have been interested in the subject of trifacial neuralgia since my student days and have followed it with a few interruptions since that time. The disease has been well-recognized by the profession for a great number of years.

In 1884, J. Ewing Mears recommended excision of the gasserian ganglion for the cure of trifacial neuralgia, so we can see that it has been recognized as a surgical disease since that time. Medical men of early times failed to treat it successfully, and those of later years have likewise failed.

Although gangliectomy was recommended by Mears in 1884, it was not performed until 1890, by William Rose, who described the operation as being complicated and difficult. He resected the zygoma and coronoid process and trephined the base of the skull anterior to the foramen ovale and ligated the internal maxillary artery. He had no retractor with light attached such as Dr. Frank has shown to facilitate his work, so he must have met with many difficulties. The gasserian ganglion, because of its anatomical situation, is difficult of removal unless approached by the proper route, and this route is the result of study of surgeons since 1890.

It is rather interesting to note the technical steps which have resulted in what we now consider the classic operation, one that rivals any other surgical procedure in its facility, in its results, and in its low mortality. Anatomically the gasserian ganglion lies across the tip of the petrous portion of the temporal bone near the cavernous sinus, the internal carotid artery being separated from it merely by the dura mater. Therefore, operations performed in the early days were attended by a high mortality caused by hemorrhage from either the middle meningeal artery, the cavernous sinus, or the internal carotid artery. As late as 1903, the mortality as shown by Murphy and Neff was fifteen per cent in a series of one hundred and forty-two cases. However, excluding operations performed prior to 1899, the mortality was only ten per cent. Statistics collected by Lexer showed mortality of seventeen per cent in two hundred and one cases.

In 1891, Hartley devised an operation by which the ganglion was attacked through the temporal fossa by making a bone flap with its base above the zygoma. Krause about five months later performed the operation by the same route. Both these gentlemen made a bone flap as near the zygomatic arch as possible. The position of this

flap usually incorporated the groove in which the middle meningeal artery lies and they had hemorrhage from this vessel. After Hartley and Krause had developed their operation the technique was adopted and modified by various other surgeons, among them being Doyen, Quenne, Poirer, Cushing, Murphy and many others.

Cushing, in 1900, devised the operation which he still does. He resects the zygoma, enters the middle fossa, and performs an extradural operation after getting proper exposure similar to the one described by Dr. Frank. Shortly after this Tiffany found it was unnecessary to replace the bone flap and did the operation without it. Then Murphy found he could do the operation without resecting the zygoma and his name was "tacked on" to the procedure.

Since then the technique has been more highly developed and improved by Frazier than anyone else, and his operation is the one described by the essayist. The zygoma is not divided; an opening through the skull is made about the size of a silver half dollar which affords ample room; and with the special retractor with light attached an excellent view is obtained to facilitate the work.

Spiller recommended division of the sensory root rather than gangliectomy, in that way avoiding injury to the motor foot and nerves which is of considerable importance. Moreover, I believe corneal ulceration is less frequent after avulsion or division of the sensory root than partial or complete gangliectomy. Hutchinson still advocates resecting two-thirds of the ganglion rather than removal of the entire ganglion or division of the sensory root.

Horsely first divided the sensory root in 1891, approaching it posteriorly. His patient died from shock seven hours after the operation. Dowman, of Atlanta, in February, 1920, recommended and performed the operation under local anesthesia. I used local anesthesia in a recent case and found it had many advantages over general anesthesia, so Dowman's name should be mentioned along with others who have improved the technique of this operation. The chief advantage of local anesthesia, as we saw it, over general anesthesia, was that the patient had much less venous oozing. This is the source of prolonging the majority of the operations. General anesthesia also seems to produce considerable swelling within the dura, making it bulge, and the venous oozing is a considerable menace. Under local anesthesia we had practically no trouble from venous oozing.

Another point in the technique seems worth mentioning: Krause suggested ligating the middle meningeal artery. Subsequently Frazier recommended that the middle meningeal be controlled by plugging the foramen spinosum with wax which simplified the operation still further. As to whether hemorrhage occurs from the cav-

ernous sinus or the internal carotid artery lies principally with the skill and care used in locating the ganglion and separating the dura from it. We had some difficulty in one case in locating the ganglion on account of the venous oozing. We finally separated the dura from the ganglion and thought we had divided the sensory root. The condition of the patient became critical and we decided to discontinue the operation. Subsequently the attacks recurred which showed that we had not disturbed the sensory root. Under local anesthesia the incision was reopened and with the piece of dura which had formerly been separated as a guide the sensory root was easily exposed and divided.

The symptoms of trifacial neuralgia are characteristic. Every patient tells a similar story of his illness, so there should be no mistake in the diagnosis. The pain is described as sudden, sharp, stabbing, burning or boring, as though from a hot iron. The paroxysms occur in cycles the intervals between cycles gradually becoming shorter and the attacks becoming of longer duration. Once the diagnosis is made there is no excuse for not following the methods of treatment suggested by the essayist, that is either injection of the nerve roots with alcohol, or avulsion or division of the sensory root. There are some who still believe in removal of the ganglion in toto or partially, but personally I prefer the operation of Spiller, that is division of the sensory root.

H. H. Grant: I have had considerable experience with trifacial neuralgia and have found that satisfactory results can often be secured by removal of the peripheral portion of both the infraorbital and second division of the nerve through the infraorbital canal. The operation is simple and can be done without difficulty by anyone with ordinary skill.

In individuals beyond the sixtieth year, at least in a considerable proportion of cases, relief has been permanent. In a few instances following this operation in younger people there has been a slight return of pain, but in nearly every case where the operation has been done after the sixtieth year there has been great relief and the patient has been satisfied without any further operative procedure.

Removal of the gasserian ganglion now is a more simple operation than it was years ago, and the improved technique has made it much less dangerous. I have performed this operation seven times. In these cases the ganglion was avulsed instead of dividing the sensory root. In the last operation undertaken I endeavored to locate the sensory root but did not succeed and removed the ganglion by avulsion. All the patients recovered from the operation and with the exception of one are well at the present time. In one of these there has been recurrence of the pain; the operation was performed five years ago. This patient

reports to me occasionally and the injection of alcohol has given him relief for weeks and months at a time, although he is not perhaps entirely free from pain at any time. The man is a farmer and able to attend to his work, but has more or less neuralgia recurring every two or three weeks. The suffering he had before the operation has never returned and the small amount of pain he now has is relieved by the injection of alcohol. The alcohol is injected around the nerve rather than directly into it. The needle is inserted until bony resistance is encountered and ten or fifteen drops of about 95 to 97 per cent alcohol injected.

The simplified operation of dividing the sensory root according to the technique as described by Dr. Frank in individuals under 45 years is the proper step in the majority of cases of severe trifacial neuralgia known as *tic douloureux*. It has been my custom to first try the superficial operation, that is removal of the peripheral portion of the nerve. I advise this as the primary step because it is often successful and the mortality is nil. In one case where I removed the zygoma there was considerable hemorrhage from the middle meningeal artery and packing was necessary to control it, the operation being completed in two stages. There was no recurrence of hemorrhage at secondary operation a few days later, the ganglion being readily exposed and removed by avulsion.

In none of the cases I have seen was there any ulceration of the cornea following operation, but more or less paralysis of the nerve controlling the eyeball was noted in two or three which caused some annoyance but did not affect the integrity of the eyeball.

I think we are justified in resorting primarily to radical surgical measures in severe *tic douloureux* occurring in the earlier years of life provided the patient is a proper risk; but in elderly subjects superficial operations are indicated as the first step.

B. C. Frazier: I have seen three cases of trifacial neuralgia in women. Two of the patients I only saw a few times. The third was a school teacher who began to suffer with neuralgia at the age of twenty. She finally developed *tic douloureux* and has since been operated upon twice by the alcohol injection. The first operation gave her complete relief for many years; the second was performed three years ago. She still enjoys freedom from pain.

F. C. Simpson: The most interesting case of trifacial neuralgia I ever saw occurred in a girl of twenty years. Dr. William C. Dugan resected the supraorbital nerve which was followed by complete relief. The patient suffered intense pain for five years before she would consent to be operated upon.

W. E. Gardner: It is my opinion that in the

great majority of cases permanent relief from *tic douloureux* can only be obtained by surgical intervention. Neurologists are not infrequently consulted by patients of this class, although I have personally seen not more than a half dozen cases, and we know that results are very discouraging so far as medical treatment is concerned. Attacks of trifacial neuralgia develop suddenly, with little or no warning, just like an attack of epilepsy, and on this account some authorities have referred to the condition as "an epileptiform facial neuralgia." There is no connection between this condition and that of essential epilepsy, so far as we know, however.

It is claimed by some observers that there is probably an obliterative arteritis in most of these cases, and this would probably account for some of the seemingly spontaneous cures occurring in patients after fifty or sixty years of age, and also for the permanent relief obtained by some after even a peripheral operation in those of advanced years. The obliterative arteritis would not only account for the attacks of pain, but also for the lack of nutrition to the nerve, and finally for the degenerative process of the nerve which may extend to the ganglion itself, and thus the pain may eventually cease of its own accord. I would be glad to have Dr. Frank's opinion in reference to this in closing, and also whether he has noted much atrophy of the muscles of mastication after complete extirpation of the gasserian ganglion where both motor and sensory roots have been destroyed. It is, of course, preferable to divide only the sensory root, as he has indicated, but we know the entire ganglion is frequently removed. It would not affect the muscles of expression as these are supplied by the seventh nerve; but those of mastication are supplied by the fifth, and are to be thought of in an operation of this sort.

L. Wallace Frank, closing: Following complete extirpation of the gasserian ganglion, including the motor root, there is paralysis of the muscles of mastication. It must be remembered that anatomically the motor and sensory roots lie very close together; if they are not carefully separated and the motor root is destroyed during removal of avulsion, the patient will most likely develop paralysis of the muscles of mastication and the mouth when opened may be drawn slightly to one side. However, relief from pain is great and the deformity is so slight that the patient rarely makes any objection to it.

Patrick carefully analyzed two hundred cases of trifacial neuralgia, one of which developed at the age of seven and another eight years; he saw the patients later in life. One reason trifacial neuralgia is supposed to be a disease of advanced age is that pain noted earlier in life is attributed to some other cause and a correct diagnosis is not made. The attack subsides and perhaps later the patient consults another phy-

sician, and when a correct diagnosis is made the patient is several years older. The following table shows the percentage by decades in the two hundred cases analyzed by Patrick:

Decade.	Per cent.
First	0.1
Second	1.5
Third	5.5
Fourth	18.5
Fifth ..	28.0
Sixth	29.5
Seventh	12.5
Eighth	4.0

The duration of relief following peripheral avulsion lasts so long as the nerve does not regenerate. That is one reason why we advise plugging the canal after removing the nerve. Some operators have attempted to prevent regeneration of the peripheral nerve by removing about an inch and transplanting the distal end under the muscle—but regeneration occurred just the same.

The relief from pain following avulsion of the nerve is decidedly longer than that from alcohol injection. Avulsion is indicated especially where pain is in the ophthalmic division of the supraorbital nerve and alcohol injection is contraindicated. I have never seen a case of trifacial neuralgia where pain was limited to the supraorbital nerve. It must be remembered there are many other causes of supraorbital pain. Chronic sinus disease with obstruction of the nasal duct produces a vacuum which always causes pain along the distribution of the supraorbital nerve. Such patients should be referred to the nasal specialist.

Dr. Grant says he injects alcohol around rather than into the nerve. Of course, no one can hope to penetrate the nerve with the needle in every instance. If alcohol is merely injected around the nerve pain returns much sooner than if deposited into the nerve. An experienced operator knows when the needle has entered the nerve which is dense and offers resistance during the injection. If the alcohol is readily injected, like an ordinary hypodermic injection into the cellular tissue, one may be certain the needle is not in the nerve. Pain ceases shortly after alcohol is injected directly into the nerve tissue.

Capillary Blood Pressure.—E. Kylin describes an apparatus for measuring capillary pressure in a finger. It is easily attached to a microscope and consists of a chamber, connected with a water manometer and air pump. In benign nephrosclerosis the pressure was found normal (not over 190 mm. water). In glomerulonephritis (100 cases) in acute stage the pressure rose to 750 mm., corresponding to 55 mm. mercury. As recovery proceeds, this pressure subsides, following the arterial pressure.

MANAGEMENT OF CANCER OF THE RECTUM*

By BERNARD ASMAN, Louisville.

While it is manifestly impossible to develop or devise a standardized method applicable to all cases, it is nevertheless highly important that certain absolute and well-defined general principles be carefully laid down for guidance in determining the correct treatment and proper advice to be given patients afflicted with cancer of the rectum. In this the surgeon and the internist are equally interested, because it is the latter who most frequently sees or at least has the opportunity of seeing these patients when the disease is in its incipency. To the internist also are returned many patients who come to the hands of the surgeon too late for operative intervention. These and the obviously inoperable cases concern the internist particularly, for it is he who is expected to meet the complications as they arise and to smooth with all the skill he can command the paths of the incurable.

The treatment, radical or palliative, appropriate in a given case depends upon the stage of progress or development of the neoplasm. Too obvious to deserve mention is the fact that correct treatment of a malignant growth still in its incipency would be improper for the same disease in later stages of its development, and *vice versa*. Between these two extremes, however, are to be found many and various types, each deserving special study to determine correct management or treatment.

From time to time attention has been called to the ever-increasing prevalence of cancer throughout the civilized world. In a pamphlet issued by the American Society for the Control of Cancer, there appears the statement that during the great war the United States lost about eighty thousand soldiers, and that during the same two years one hundred and eighty thousand people died from cancer in this country. Cancer is now killing one out of every ten persons over forty years of age. Many of these deaths are preventable, since cancer is frequently curable if recognized and properly treated in its early stages. Cancer begins as a small, local growth which can often be entirely removed by competent surgical treatment, or in external forms by using x-ray, radium, or other methods. The beginning of cancer is usually painless, for this reason its insidious onset is frequently overlooked and is too easily neglected.

In confirmation of the points made in the foregoing, there recently appeared in the Jour-

*Read before the Jefferson County Medical Society.

nal of the American Medical Association the assertion that in Switzerland cancer is so prevalent that every twelfth person over thirty-five years of age faces the prospect of dying from this disease. Tuttle, in his book on Diseases of the Rectum, written about twenty years ago, said vital statistics showed an alarming increase in the prevalence of carcinoma. Figures quoted by him showed that the disease increased in England and Wales from one in 5646 in population in 1840, to one in 403 in 1894. Medical literature in the last two decades indicates a steady increase in the death rate from cancer. From study of statistics, as compiled by various authors it is estimated that about five per cent of all cancers involves the rectum.

The symptoms of cancer of the rectum developing insidiously depend largely upon the type of the neoplasm and its location in the canal. Cancers involving the anal orifice and sphincters, of course, cause earlier and much greater pain than those originating in the upper rectum. Not infrequently cancer may exist in the upper rectum or the sigmoid for a considerable period of time before the health of the individual apparently suffers. For that reason careful examination, not of the anal canal only, but of the upper rectum and sigmoid, should be made although the symptoms may be only vague in character, or even amounting to but indefinite discomforts about the sacrum or pelvis.

Hemorrhage from the rectum, loss of strength, pain, etc., not otherwise accounted for, should suggest a careful proctosigmoidoscopic examination. Simple digital examination of the lower rectum may fail to disclose beginning or even advanced malignant disease which not infrequently develops in the rectum beyond reach of the finger. Failure to recognize such growths need not occur if proper investigation is made.

Frequent defecation, particularly, if the dejecta contains blood, mucus and pus, should always suggest the necessity of complete examination.

Extension of the malignant disease into the bladder, the prostate, seminal vesicles, etc., is not an infrequent complication; yet many times the growth may become attached to adjacent organs or structures through inflammatory adhesions without the organs themselves becoming implicated in the neoplastic change. Tuttle says that he has twice removed portions of the prostatic gland and seminal vesicles in the excision of rectal cancer and found these organs were entirely free from cancer.

The writer a few months ago removed a rectum which was the site of extensive carcinoma

apparently extending into the bladder which was firmly fixed to the rectal wall. Doubt was expressed by a consultant as to the possibility of removing the neoplasm together with the rectum without perforating the bladder or removing the entire posterior vesical wall. Careful dissection showed that it was possible to remove the growth together with the rectum without entering the bladder, it being found to be firmly fixed to the rectum by simple inflammatory adhesions. Subsequent developments in the case showed the absence of malignant change in the wall of the bladder. It is, of course, admitted that adjacent organs may be involved through extension by contiguity of the carcinoma, but the point to be emphasized in this connection is that adhesions do not always mean extension of the malignant process.

The most frequent lines of extension of carcinoma of the rectum are: through the lymphatics, possibly through the blood stream, and by continuity of structure. In cancer about the anus, it may extend by continuity upward into the rectum, the ischio-rectal fossa being involved, or externally into the scrotum, vulva, or vagina. Cancer in the subperitoneal portion of the rectum extends by contiguity to the prostate, the bladder, uterus and adjacent structures, although, as already stated, apparent implication of these organs must not be taken for granted until careful examination has been made to determine the facts.

Involvement in remote localities may occur through metastasis. This, however, does not occur so often nor so early in malignant disease of the rectum as in cancer of certain other locations. Whether this takes place through the lymphatics or the blood stream is a mooted point.

The manner of dealing with the particular patient afflicted with rectal cancer depends ordinarily upon the stage of development of the neoplasm. In a general way it may be said that if the cancer is still a local lesion, that is without adjacent irremovable structures being involved and without metastasis elsewhere, the proper treatment to be instituted is immediate and complete removal of the malignant tumor. As a matter of course, the general condition of the patient must be taken into account when so formidable an operation is contemplated. If the growth has existed for a considerable length of time before being discovered, it may be necessary to take steps to improve the patient's general condition before operating. Daily irrigations of the rectum together with appropriate tonic medication, attention to diet, exercise in the open air, rest, etc., may be advisable. The most important features of all, however, is

determine the exact extent of the disease. It is oftentimes impossible to do this with precision either by digital or sigmoidoscopic examination. When such is the case an exploratory celiotomy is necessary, the line of incision being so placed that it may be utilized as the site of a temporary colostomy if found advisable. The incision should be made long enough to permit insertion of the entire hand into the abdominal cavity. In this way it is possible, and as a rule comparatively easy, to determine the extent of the malignant disease, the presence or absence of metastatic involvement about the liver, other abdominal organs, or prevertebral lymphatics. If it can be determined that the growth is still a purely local lesion, immediate plans should be made for its radical removal.

The relative number of operable and inoperable cases encountered is not easily determined, and can be approximated only by reference to statistics covering a large number of observations. For example, Mayo (W. J.) states that of six hundred and nineteen cases 53.1 per cent were determined operable. Lymphatic involvement is usually late, and in no case was lymphatic extension alone the cause of inoperability in his series of cases. In four hundred and thirty radical operations he gives the operative mortality as 15.5 per cent. During the following three years, although the operability was increased to 71.8 per cent, the mortality was reduced to 12.5 per cent. Still later it was further reduced to about 10 per cent, presumably due to earlier diagnosis and improvement in operative technique.

In a recent statistical report Kuttner (abstract in J. A. M. A.) analyzes more than one thousand cases of rectal carcinoma. He found the disease more frequent in males (62 per cent) than in females (38 per cent). Among the former, individuals between fifty and seventy years of age were chiefly affected, and in the latter those between forty and sixty. Eight cases were mentioned between the ages of seventeen and nineteen, and thirty-seven between twenty and twenty-nine, those in early life being more frequently in females. Of the total it is stated that 32 per cent were suitable for radical and 17 per cent for palliative treatment. "The high percentage of inoperable cases is especially regrettable because in carcinoma of the rectum early diagnosis is so readily made." The author estimates that in from 60 to 70 per cent of the inoperable cases, although a physician had been consulted in time, a thorough rectoscopic examination had not been made, the patients having been treated conservatively for hemorrhoids, chronic "catarrh of the rectum, etc. Following radical operation, 32.5 per cent sur-

vived three years longer; 21.6 per cent lived over five years; 16.4 per cent more than eight years, and 12.8 per cent more than ten years. Of those who survived operation three years or more, twenty-one died from recurrence in the fourth or fifth year; eight more in six to eight years, and three in the ninth and tenth years. Kuttner argues that the advantages of radical operation lie not so much in the fact that the lives of the patients may be somewhat prolonged as in the relief from pain and discomfort which may be thereby afforded.

The greatest danger of the operation lies in the possibility, or rather the probability, of infection. That this may be avoided the fecal current should be diverted by means of a colostomy which should be made at the time the exploratory celiotomy is done. Through the colostomy opening daily irrigations of that portion of the rectum to be removed may be accomplished, thus eliminating much of the infected tissue and getting the rectum in as good condition as possible for removal.

After the abdominal wound surrounding the protruding intestine has healed, usually in about two weeks—in the meantime attention having been given to the patient's general condition—radical removal of the rectum, or whatever part of it may be necessary to effect complete eradication of the growth, may be undertaken. The operation of excision of the rectum under such conditions, that is with preliminary colostomy and previous thorough cleansing of the part to be removed, is not particularly difficult; and with the precautions described to prevent infection of the wound, the mortality from such an operation should be but little if any greater than from any other major operation about the abdomen or pelvis.

Unfortunately many of the patients suffering from rectal cancer when seen by the surgeon are beyond the stage of development which has been mentioned. Even though from digital and sigmoidoscopic examination one may reasonably believe or at least hope that the growth has not extended far beyond its point of origin and that no metastasis exists, yet upon opening the abdomen such involvement may be found as will preclude all hope of benefit to be derived from attempted radical measures. It is the firm conviction of the writer that whenever extension of the malignant disease has occurred, be it into other organs or simply glandular involvement, beyond the possibility of absolute and complete removal, that the original growth should not be removed or in any way disturbed. In such cases palliative procedures are indicated, foremost among which may be mentioned perma-

ment colostomy. It is, of course, well recognized that many competent and experienced surgeons recommend colostomy only when made necessary by practically complete obstruction of the rectal lumen by the malignant growth. In the opinion of the writer this is an erroneous view, since colostomy when properly performed is in a number of ways of the greatest advantage to the unfortunate sufferer from irremovable cancer of the rectum.

First: Because of the irritation produced by the growth nearly all such patients have from ten to twenty or more stools each day; these frequent defecations are accompanied generally by distressing tenesmus and pain, loss of blood and consequent rapid diminution of strength; colostomy affords the quickest and most efficient relief.

Second: Because of the prevention of the added irritation due to the passage of feces over the growth, the rapidity of its development is lessened.

Third: Because colostomy offers an easy method through irrigation of keeping clean that part of the rectum involved, thus again lessening the irritation.

Fourth: Because of unobstructed defecation through the colostomy opening the straining otherwise necessary to force feces through the narrowed rectal lumen at site of the growth is obviated, thus permitting return to normal of the otherwise swollen or edematous rectal wall proximal to the neoplasm.

Fifth: Because the concomitant digestive disorders almost invariably present when cancer of the rectum has reached the inoperable stage are relieved by colostomy, since it affords ready exit for fecal accumulations.

In the inoperable cases where the patient has been afforded the advantages of colostomy, further palliative treatment, such as the judicious use of opiates, irrigating fluids, attention to diet, tonic medication, and the like, must be determined by the physician in charge according to the indications and needs of the individual patient.

CONCLUSIONS:

(1) That the prevalence of cancer of the rectum is far greater than is generally believed.

(2) That its importance merits wider discussion and the adoption, if possible, of more definite methods of treatment.

(3) That the most important factor in successful management of these cases consists in early diagnosis, and this means more frequent and more painstaking rectal examinations; also proper attention to so-called "pre-cancerous lesions."

(4) That when by surgical operation complete removal of the malignant neoplasm is possible, such procedure should be promptly

advised and should be done without unnecessary delay.

(5) That when because of metastatic or other extension of the malignant disease complete removal is impossible, no partial removal should be attempted; nor should the growth in any other way be disturbed; but palliative measures, including in most cases permanent colostomy, should at once be instituted.

DISCUSSION:

John R. Wathen: What concerns the surgeon most is to see cancer patients early while the disease is still in an operable stage, in that way obtaining the maximum operability. Second, to secure the minimum primary mortality, and it has been clearly demonstrated in recent literature that this may be obtained by the two-stage operation. The third point naturally follows, i.e., to have the smallest possible percentage of recurrences.

Kraske's statistics, embracing eighty cases, showed a primary mortality of eighteen per cent. Mayo reported a series of five hundred cases with a primary mortality of sixteen per cent. The statistics of Crile show no mortality in his last thirty-eight consecutive cases of rectal cancer. His position on this question hardly admits of argument; his cases are carefully selected; he operates upon the majority of the patients early; he has not attempted radical surgery for the inoperable cancer; he uses the two-stage method.

In connection with the operability of rectal cancer, it is interesting to note that in the early work of the Mayos seventy-five per cent of the patients presenting at the clinic were considered inoperable, i.e., they operated upon only twenty-five per cent, with a mortality of about five per cent, and their five-year cures were between sixty and seventy per cent. Later they reversed their statistics, operating upon 75 per cent of the patients with the result that their mortality increased from five to nearly sixteen per cent, and their percentage of permanent cures greatly diminished. In other words, the pendulum was allowed to swing too far in the opposite direction and they operated too late in the disease.

I think the wisdom of preliminary colostomy has been well established by surgeons who have operated upon a large number of patients for rectal cancer. Crile, Bevan and others claim, however, that preliminary colostomy should be made high on the right side (not the left) thus making it possible to examine the liver and other viscera through the opening to determine the presence or absence of metastasis. Radical operation is performed later when the condition of the patient justifies further surgery. Where the entire rectum is not to be sacrificed many surgeons

now advocate excision of the neoplasm and end-to-end anastomosis. Where the bladder and prostate are involved, or internal metastasis has occurred, the case is considered inoperable. I believe the Kraske operation has rightly fallen into disuse.

If the surgeon expects to accomplish anything in the treatment of cancer operation should be undertaken at the proper time, i.e., before the disease has progressed to the inoperable stage. The only way this can be done is to educate the general practitioner, who usually sees these patients first, to refer them early to the surgeon. I believe the fact that we are now getting cancer patients earlier than formerly is largely due to the excellent work our x-ray friends are doing. They are sometimes able with the x-ray to discover cancer much earlier than would be possible based upon clinical evidence alone.

Wm. J. Young: I agree with everything the essayist has said in regard to operative procedures, but in addition wish to call attention to the fact that in radium we also have a valuable adjunct in the treatment of rectal cancer. After preliminary colostomy has been performed, by the use of radium there is a possibility of preventing or checking metastasis. Following radical operation radium should also be used to increase the prospects of permanent clinical cure. This may be reinforced if desired by "cross-firing" with the x-ray over the entire abdomen.

I believe in every case of rectal cancer x-ray and radium should be used not only after preliminary colostomy but also after radical operation has been performed.

Bernard Asman, closing: I quite agree with Dr. Young with reference to the use of radium. However, the radium treatment of cancer was not included in the scope of my paper. There are other therapeutic measures which were not mentioned in the paper.

As I understand the matter we are still on the threshold concerning the use of radium and x-ray in the treatment of rectal cancer, and I certainly hope they will prove as advantageous as we have been led to anticipate.

Of course we all agree with what Dr. Wathen has said about operability. His point is excellent that early diagnosis of cancer will many times be made possible through the work of our x-ray colleagues. No doubt they will sometimes be able to discover neoplastic formations which might not be revealed, either by palpation or rectosigmoidoscopic examination.

As a matter of course we need the help of every possible adjunct when it comes to handling conditions as formidable as cancer of the rectum.

ANOMALOUS APPENDIX; UTERINE MYOFIBROMAS; PAROVARIAN CYSTS; HYDROSALPINX.*

By J. GARLAND SHERRILL, Louisville

The first specimen I desire to exhibit is an appendix removed from a boy of twenty. The only unusual feature about the specimen is that in addition to the ordinary mesenteric covering the appendix is surrounded by a membrane which I believe is due to inflammatory changes.

This patient had his first attack of appendicitis five years ago. Within the last few months he has had a number of attacks of pain in his right side. He consulted his physician about a week ago and was referred to me for examination. At that time he was evidently just recovering from an attack. There was some thickening to be felt in the right iliac fossa.

I suggested that an operation for removal of the appendix would be advisable, and operated upon him today. The symptoms were not urgent, and he was kept in the hospital two days before operation was undertaken. This boy had a normal temperature at the time I saw him, and it continued normal so far as I know until the time of operation. He was on a restricted diet and while he had pain in his right side he went along very satisfactorily and came to operation today.

The appendiceal walls were exceedingly thick, the appendix is short and clubbed, and there was obstruction near the cecal extremity as some introliths were found in the lumen. There were also present two or three enlarged lymphatic glands at the base of the appendix.

The second specimen is from a woman 48 years of age. The diagnosis in this case was made twelve years ago; the woman refused operation at that time.

She came to operation January 15, 1921, and then presented a considerable amount of abdominal pathology. She had, of course, the usual symptoms which need not be related. She presented a very large multilobular myofibroma of the uterus which had undergone a variety of degenerative changes. Some of the masses were distinctly cartilaginous in type only a small amount of the original tissue fibers being present. We had every type of fibroid tumor represented in this uterus. In addition the patient had a parovarian cystoma on the right side and a hydro-salpinx on the left.

*Clinical reports with exhibition of specimens before the Louisville Medico-Chirurgical Society.

I might mention also that she had undergone three operations before I saw her for fistula in ano, the condition being finally cured, but the sphincteric control was lost because of two incisions of the muscle. I was requested, in addition to the other surgical work, to make an effort to restore sphincteric control, and did make such an effort, but do not know with what success at this time.

The main reason for showing this specimen is that it is a fact that uterine myofibromata undoubtedly undergo marked changes and these changes may at any time be malignant; therefore, these tumors should be removed without delay. In this instance the great amount of pathology was another reason for reporting the case.

The patient had no endometrial fibroid development and therefore had never been the subject of hemorrhage from the uterus.

DISCUSSION:

George A. Hendon: I would like to ask Dr. Sherrill whether it is his practice in cases of the type last reported to remove the entire cervix. That is a question which is engaging quite a lot of attention just now. Of course we know it is the safest thing in the long run to remove the cervix, but it is the most hazardous thing in the short run.

Louis Frank: The question of uterine myofibroma is important and it is sometimes difficult to decide just what should be done. What Dr. Sherrill's opinion may be I do not know. Certainly I believe in ordinary simple fibroids, whether in a child-bearing or non-child-bearing woman, where the cervix is apparently not diseased, taking into consideration the increase in mortality from total removal which is comparatively much greater, there is really no necessity of removing the cervix in toto. My own practice has been in recent years in practically all these cases to do a subtotal hysterectomy, removing the mucosa of the cervix and completing the operation in the usual way. If this is done the mortality is no greater than after supravaginal hysterectomy with the same protection as in panhysterectomy.

The case reported by Dr. Sherrill is interesting and shows what may occur where operation is long postponed. No patient should be permitted to reach such a dangerous stage in the presence of a fibroid tumor. That may not have been true in this particular case, because the degenerative changes which occurred were not of such a character as to endanger life, but we know changes may occur which seriously menace the life of the patient. Therefore, I believe every fibroid tumor should be removed by hysterectomy or otherwise. Operation should not be indefinitely postponed. While I do not believe fibroid tumors

of the uterus really undergo carcinomatous degeneration, yet the presence of the tumor in the uterus may through its irritating effects on the mucosa cause development of carcinoma in the body of the uterus, and that is another reason for removing such tumors.

With reference to the first case Dr. Sherrill reported: We not infrequently see cases in which the appendix is covered by a false membrane as a result of previous attacks of appendicitis. I think all the so-called fulminating cases of appendicitis, whether there is a definite history or not, have always been preceded by previous attacks. Of course there are cases where the appendix may be subperitoneal, the so-called Jackson's veil is occasionally seen, etc., but in the majority of instances these false membranes are the result of prior attacks of inflammation. We have in the hospital now a man operated upon for appendicitis a few days ago who had an appendix of the type shown by Dr. Sherrill. The patient had suffered numerous attacks of pain in the right side of the abdomen before coming to operation.

I am not one of those who believe that appendicitis always results fatally. The case reported by Dr. Sherrill demonstrates that fact very clearly.

J. Garland Sherrill, closing: I believe Dr. Frank has fully answered the question asked by Dr. Hendon. My belief is that the probability of carcinoma appearing in the stump after hysterectomy for uterine myofibroma is rather remote. In other words, the additional mortality from panhysterectomy would be so great that it would be unwise to recommend this operation as routine. It is advisable to make a small stump and to excise as much of the stump tissue as possible. In that way the probability of degenerative changes is lessened.

I neglected to state in my report one of the findings noted at the operation. The spleen contained several nodular areas, the masses were calcareous in hardness, and I was unable to explain to my own satisfaction just what was the suggestion in my mind that perhaps there was a malignant factor in the case. The woman had causative factor of these nodules; but there was a certain amount of pallor, but otherwise there was no evidence of malignancy.

Phosgen Poisoning.—Wiki discusses phosgen poisoning in war and in certain industries, but adds that physicians must not forget that this gas may be generated during the administration of chloroform in a room lighted with gas. He describes an experience of the kind in Mayor's practice. Irritation in the larynx with a prickling in the throat, spasmodic cough and disagreeable odor in the room warned of danger.

RECENT ADVANCES IN THE PREVENTION AND TREATMENT OF DIPHTHERIA*

By A. PARKER HITCHENS, Indianapolis

Persons interested chiefly in the purely scientific aspects of medicine are wont to think with pride of the achievements growing out of the bacteriological investigations of diphtheria. In no other infection has the results of research been equally fruitful of measures so promising from a practical standpoint. We have for years been acquainted with the biological characteristics of the specific cause of diphtheria, the mechanism by which it exerts its pathogenic effects and the mode of its transmission from person to person. We are able to identify those individuals who are susceptible to diphtheria and to render such persons resistant to the disease by very simple means, and yet the annual morbidity in this country is nearly 250,000. For no other infection have we so efficient a therapeutic agent as we have in diphtheria antitoxin and yet the average mortality is in the neighborhood of 10 per cent, amounting to approximately 25,000 deaths each year. Thus the incidence of diphtheria continues to make it one of the important diseases of childhood and one of the infections upon which we are spending many thousands of dollars every year. In other words, in spite of the fact that we have sufficient knowledge to eradicate diphtheria we seem to be nowhere near accomplishing this most desirable end.

Public health officials have learned, sometimes by bitter experience, that in the suppression of infectious diseases there is a vast difference between "knowing" and "doing." It has come to be axiomatic in public health work that education must precede regulation and it is only when campaigns are started upon this plan that they are likely to be successful, unless, indeed, one has military authority and an organization back of him which can be influenced only by the central authority. The magnificent work of Gorgas in making it possible to build the Panama Canal could scarcely have been accomplished if he had been compelled to depend upon the acquiescence and cooperation of the general public in the regulations he promulgated. And in the face of rapidly spreading and fatal epidemics it is sometimes necessary to utilize the police powers of a civil community to their fullest extent, as would be the case in fighting an epidemic of bubonic plague, or yellow fever, or Asiatic cholera. But in the

case of a disease like diphtheria which has been with us always and which is not increasing to an alarming extent, such measures although possibly justifiable would certainly not be tolerated by the civil population of this country. We know how to eradicate diphtheria but it is only when the people demand the application of the necessary measures that any benefit will be derived from our knowledge of them. The measures are really simple in themselves but the general population must understand them, and be convinced of their simplicity and effectiveness.

The possibility that there are some members of this association who, while thoroughly familiar with all these measures, have not quite realized how simple their application may be made, is my reason for presenting this paper which is intended to discuss only the purely practical phases of the prevention and treatment of diphtheria as influenced by recent research.

I shall confine my remarks, therefore, to the following four points:

(1) The persistence of virulent bacilli in the throats of convalescents.

(2) Identification of persons immune or susceptible to diphtheria.

(3) Active immunization of susceptible individuals.

(4) Relative effectiveness of various methods of antitoxin administration.

1. The persistence of virulent bacilli in the throats of convalescents:

In epidemiology an important problem is always that of locating the place or places where the specific cause of the disease maintains its existence outside the active disease area. There is no mystery about this so far as diphtheria is concerned. The convalescent and the contact and healthy carrier constitute the only important sources of infection. Convalescent carriers are as a rule effectively isolated but there are many healthy carriers at large. It may even be questioned whether or not the release of convalescents after a definite period—dependent upon their own physical state and not upon the presence of virulent diphtheria bacilli in their throats—would make much difference in the incidence of the disease. There are many reports in the literature of studies concerning the percentage of healthy carriers in the general population; one of the most conservative is that of Goldberger, Williams and Hachtel. Without selecting the persons examined they made cultures from 4000 individuals, 38 of whom were found to harbor virulent diphtheria bacilli. This amounts to nearly one per cent and means that in a city of one-half million people there would be approximately 5000 healthy carriers.

*Read before the Jefferson County Medical Society.

It is well known that during epidemics the number of such healthy carriers is always greatly increased. Our position with regard to such persons is clearly stated by Cannata in a recent paper. He refers to the suppression of a threatened outbreak of cholera in the Italian Army which was effectively stopped by the Italian Army Surgeons. "The brilliant result of the anticholera campaign in the war zone serves to demonstrate that with a good organization even under difficult conditions one may conquer a grave epidemic. And the search for carriers is certainly one of the most efficacious means which should today be applied in the prophylaxis of any epidemic disease. However, such a search is not always of practical application; it meets a difficulty, often insurmountable, to overcome which a sanitary organization would be necessary quite different from that which we possess at the present time."

Even though we may be skeptical of the ultimate value of quarantine of a relatively small class of carriers it would indeed be a step backward if there should develop any laxity in our regulations with regard to them.

The majority of patients lose their virulent diphtheria bacilli within the first few weeks of convalescence but a certain number continue to carry them for long periods. Prip reported a case in which fully virulent bacilli were present in the throat for 335 days.

In considering the problem of the eradication of the carrier state we have to take into consideration the fundamental reasons for its existence. The fact that virulent diphtheria bacilli can maintain their existence in the tissues without exciting any apparent local reaction means that no ordinary measure is likely to affect them. Their persistence in healthy cells and body fluids tolerate the presence of no foreign substance without visible healthy tissues would not be possible, for the eliminative reactions. When a convalescent patient is still showing positive cultures after three or four weeks a careful examination of the nose and throat is indicated, for either the diphtheria bacillus has found a pre-existent focus where it does not come within the influence of the antibacterial forces of the tissues or such a nidus has been formed during the disease process.

This accounts for the lack of success which attended the many efforts to devise a satisfactory treatment. These efforts include the use of every variety of spray and gargle together with the local application of such things as silver nitrate, iodine and phenol; the inhalation of vapors of iodine, iodoform, thymol, creosote and camphor; the application of powders either directly or by insufflation—kaolin,

pyocyanase and dried diphtheria antibacterial horse serum; the injection of diphtheria antitoxin, antibacillary serum, toxin and vaccine; and more recently the application of living cultures of staphylococci and the *B. bulgaricus*. Good results are claimed by Roskam for the local application of diphtheria antibacterial serum but he obtained equally good results with antimeningococcus serum from which he deduces that no specific effect can be claimed for the former.

A careful study of the literature upon the treatment of the convalescent carrier leads to certain definite conclusions: That focus of infection should be carefully sought and if adenoids or infected tonsils are found they should be enucleated. Some writers claim there is no danger from diphtheria following the operation even though virulent diphtheria bacilli may be present; others fear such a complication. It would be a simple matter to immunize the patient before the operation either passively by antitoxin or actively by the toxin-antitoxin mixture. In lieu of a possible operation some form of treatment seems desirable although it may have little effect upon the carrying period. The patients and their friends are better satisfied and the applications may help to destroy and remove those bacteria which are upon the exposed surfaces. Of the treatments advocated the local application of silver nitrate would seem to be the best together with a solution for use as a spray and gargle. The formula for this is of minor importance provided it is slightly alkaline, exerts about the same osmotic pressure as physiological saline solution and is not irritating.

2. Identification of persons immune or susceptible to diphtheria:

According to Hill a large proportion of convalescents released upon two negative cultures later become positive, and when we add to these the many unrecognized carriers everywhere it seems certain that in every public gathering a large number of persons are exposed to infection and we are inclined to wonder why the incidence is so low. The only deduction possible is that relatively few persons are susceptible and this through studies with the Schick test, has been found actually to be the case. This intracutaneous reaction was developed and studied by Schick, but it is chiefly to Park and Zingher that the credit is due for much important information concerning it and an exact method for applying the test.

The Schick outfit consists of a capillary tube containing a definite amount of carefully standardized diphtheria toxin. The tube is broken at both ends, just as in opening capil-

lary tubes of vaccine virus and the diphtheria toxin is forced out into sterile physiological saline solution. The amount of toxin and the amount of saline diluent are so adjusted that the proper dose is contained in 0.2 c.c., of the mixture. This is approximately two drops. The freshly made mixture is then injected into the layers of the skin—not beneath the skin. It is best to use a tuberculin syringe of the Record type with fine steel or platinum-iridium needle. The amount of toxin represents one-fiftieth of a minimum fatal dose of toxin for a 250-gram guinea pig.

The best place for making the injection is the flexor surface of the forearm or the delicate skin of the upper arm. After washing the skin with alcohol it is drawn taut with the thumb and the needle inserted almost parallel with the skin. If the needle is in the proper location the fluid injected raises a little weal or vesicle.

It is well, especially in testing older children and certainly in the case of adults, to use a control injection in the other arm. This consists of the same diphtheria toxin but heated to 75 degrees for five minutes in order to destroy the specific toxin. A certain proportion of individuals show a reaction when injected with heated toxin which is merely an allergic phenomenon to the proteins of the toxin broth and has nothing to do with susceptibility to diphtheria.

The result of the injection should be read at the end of 24, 48, 72 and 96 hours. Four results are possible:

- (1) Positive reaction.
- (2) Negative reaction.
- (3) Pseudo-reaction.
- (4) Combined positive and pseudo.

1. The *positive reaction* is produced by the local irritant action of the diphtheria toxin and means that the tissues do not contain sufficient antitoxin to neutralize it; in other words, a positive reaction means the absence of immunity to diphtheria. There gradually appears about the point of injection in from 12 to 24 hours a slight redness deepening into an area of distinct redness in the course of the next 24 hours. It reaches its height by the third or fourth day and then gradually disappears leaving a definite area of brownish pigmentation with a tendency to sealing; this persists for from three to six weeks. At its height the area of redness and infiltration is from 1 to 2 centimeters in diameter. The intensity of the reaction as measured by redness and infiltration is in general an indication of the relative susceptibility of the individual.

2. The *negative reaction* means that the tissues contain sufficient antitoxin to neutral-

ize the irritant effect of the toxin and is a definite indication of immunity to diphtheria—provided of course that the test toxin is of proper strength and has been injected intracutaneously. A negative reaction shows no area of redness or induration, or if there is a slight redness following the injection it is the result merely of traumatism and rapidly disappears.

3. The *pseudo-reaction*, like other cutaneous allergic phenomena appears earlier than the true or positive reaction—within six to eighteen hours and reaches its height within 36 to 48 hours. It disappears by the third or fourth day leaving a small pigmented area usually without a tendency to sealing and is less definite in outline. At its height it appears as a small central area of a dusky redness with a secondary areola shading into the surrounding skin; sometimes the pseudo-reaction is of a uniform redness and may be considerably larger than a true reaction. Those individuals who show only a pseudo-reaction possess antitoxin and are immune to diphtheria. Some experience is necessary to distinguish between a true and a pseudo-reaction so that it is advisable to immunize all children who react, unless of course the reaction is definitely pseudo in type.

4. The *combined reaction* is the result of a positive and a pseudo-reaction in the same individual. In such individuals the control test made with heated toxin is similar but weaker. In these cases the test with the unheated toxin shows a central area of redness larger and better defined and the infiltration is greater. Furthermore, after the false reaction has subsided there remains the definite area of sealing brownish pigmentation.

The Schick reaction has stood the test of time. In contagious diseases hospitals it has become the custom to test all children entering other wards and those showing negative Schick tests are given no prophylactic injection. At the Willard Parker Hospital from 15 to 20 per cent of the children showing negative Schick tests became carriers of virulent diphtheria bacilli and yet not a single one developed true clinical diphtheria.

Many interesting facts have been developed by the work of Park and Zingher especially with regard to relative susceptibility at different ages as noted in the following table:

Age	Susceptible.
Under 3 months	15 per cent.
3 to 6 months	30 per cent.
6 months to 1 year	60 per cent.
1 to 2 years	70 per cent.
2 to 3 years	60 per cent.
3 to 5 years	40 per cent.

5 to 10 years	30 per cent.
10 to 20 years	20 per cent.
Over 20 years	12 per cent.

A most important point is the fact that if a child over one and a half to two years of age shows immunity to diphtheria this is an indication that he is immune for life. Zingher made repeated tests on over 3000 children who had given a negative Schick test for the first time. During three years the negative reaction persisted in practically all.

3. Active immunization of susceptible individuals:

After having ascertained by the Schick test susceptibility to diphtheria the next problem is that of immunization. For this there are two methods and the indications for each are quite clear. If there is reason to fear definite exposure an immediate injection of 1000 units of diphtheria antitoxin should be given. But for the general protection of all infants and certain groups of older persons we have in the toxin-antitoxin mixture a prophylactic measure of the greatest value. Several years ago Theobald Smith called attention to the fact that neutral mixtures of toxin and antitoxin still possessed the power of stimulating the production of active immunity and suggested that such mixtures might be valuable for human prophylaxis. Park had already used such mixtures for the preliminary treatment of horses in the production of diphtheria antitoxin. Behring actually tried toxin and antitoxin for the immunization of man and found that they did stimulate the production of a very solid immunity. But it is to Park again and his co-workers that we owe the elaboration of exact methods for the preparation and administration of the toxin-antitoxin mixture.

The prophylactic treatment consists of three injections of 1 c.c., each at weekly intervals—children under 6 months received 0.5 c.c. The injections are given subcutaneously at about the insertion of the deltoid muscle exactly as bacterial vaccines are administered. No reaction develops in very young children but adults are likely to show redness and induration at the point of injection for the same reasons that adults so frequently show pseudo-reactions after the Schick test. These reactions are never sufficient, however, to cause alarm and they disappear in from one to three days.

The toxin-antitoxin mixture contains a very slight excess of toxin. According to Zingher, each L+ dose should have mixed with about 1.25 units of antitoxin. Therefore, each cubic centimeter is made to contain 5L+ doses of toxin and 6.25 units of antitoxin. It will be remembered that the amount of diphtheria

toxin which exactly neutralizes one unit of antitoxin is called L0 dose; the L+ dose is the amount of toxin which will kill a 250-gram guinea pig on just the fourth day when that amount of toxin is mixed previous to injection with one unit of antitoxin.

The toxin-antitoxin mixture cannot be used as an emergency measure because the production of antitoxin following its injection is relatively slow. It may require as much as eight to ten weeks to produce sufficient antitoxin to give a negative reaction upon the application of the Schick test.

During their development periods it was thought the Schick test and the toxin-antitoxin treatment would be valuable chiefly to institutions. The time for urging their use upon children's homes and contagious diseases hospitals is long past, for any such institutions must be hopelessly backward if they have not already instituted as routine procedures the testing of all inmates and entrants and the immunization of those found susceptible.

The greatest benefit will be derived from these measures only when they have been made the routine procedure in the practice of the family physician. With diphtheria still responsible for almost as many deaths annually as scarlet fever and measles together it would seem to be the duty of the physician to bring to the attention of parents the fact that while their child has a congenital immunity, this gradually disappears during the first six months. When, therefore, the infant has passed its first half year and enters its most susceptible period—between six months and four years—it should be tested and immunized if the Schick reaction is positive.

That this important matter should be discussed with parents early in the life of their child is evident from the fact that about 75 per cent of the deaths from diphtheria occur in children under five years of age.

It is unnecessary to call attention to the importance of these measures to doctors, nurses and other persons whose duty it may be to care for diphtheria patients.

4. Relative effectiveness of various methods of antitoxin administration.

In reviewing our work upon the control of diphtheria it is apparent that in treatment alone has there been any noteworthy achievement. The death rate before the days of antitoxin was about 40 per cent; it is now about 10 per cent. With 250,000 cases in the country annually, antitoxin can therefore be credited with preserving the lives of about 75,000 persons each year. Our chief concern now is with the other 25,000. Until prophylactic measures have become universal in their

application problems of diagnosis and early treatment and the details of treatment will still confront the physician.

Diphtheria is very much like a fire in a frame building. The immunity acquired by the use of the toxin-antitoxin mixture is a very efficient sprinkler system which never permits a fire to gain headway. If such an installation has been neglected and fire actually occurs it takes but little water to quench the conflagration if it is discovered early and water applied immediately, but neglected or undiscovered it will not be long before all the water in the world would be powerless to save the structure. In the treatment of diphtheria early administration is of prime importance. It will be recollected that Donitz injected guinea pigs intravenously with a single fatal dose of diphtheria toxin. He had previously determined the smallest amount of antitoxin which would save the life of such a guinea pig if the toxin and antitoxin were mixed previous to the injection. He could still save the life the guinea pig if the toxin was injected first and the antitoxin given after a delay of as much as nine minutes, but if he waited longer much more antitoxin was required to accomplish the same result, and at the end of one and one-half hours the guinea pig died no matter how much antitoxin it received.

This corresponds exactly with practical experience; a small dose of antitoxin is sufficient if the patient is seen on the first day of the disease but increasing quantities are required with each day's delay. The amount of antitoxin actually needed to effect cure depends, therefore, on the day of disease and its severity. The various writers on the subject of dosage advocate various sizes of doses; for mild cases, for instance, Park uses 5000 units, for severe 10,000 units, and for malignant, 20,000; while Woody for mild cases advised the use of 20,000 units, 30,000 units for severe, and as much as 150,000 units for malignant infections. All authorities agree in advising the use of an initial dose of sufficient size to bring about recovery without the administration of second and third injections.

The route of injection influences materially the efficacy of the antitoxin injected. When injected subcutaneously absorption is slow and as demonstrated in the following table the maximum concentration of units in the circulation is reached only after a delay of 72 hours, and never reaches the height attained when the injection is given intravenously.

Antitoxin content of blood in three adult diphtheria patients. Each received 10,000 units:

Method of injection:

Units in 1 c.c., at intervals of hours.

3 h 6 h 12 h 24 h 48 h 72 h 96 h

Intravenous (1)

3.0 2.7 2.4 2.0 1.5 1.0 0.8

Subcutaneous (2)

0.1 0.2 0.25 0.4 0.55 0.65 0.7

Intramuscular (3)

0.2 0.35 0.6 0.6 0.59 0.55

Weight of number 1, about 100 pounds; of number 2, about 110 pounds; of number 3, about 120 pounds.

Units in blood at:

12 h. 24 h. 48 h. 72 h.

Single dose 0.25 0.4 0.55 0.65

Dose divided into three given at 12-hour

intervals 0.08 0.2 0.48 0.62

The intravenous route makes the entire bulk of antitoxin available immediately and according to Park 5000 units injected intravenously is as effective as 20,000 units injected subcutaneously. The table shows furthermore that intramuscular injection is somewhat better than subcutaneous but it scarcely compares with the intravenous route.

Some fear has been expressed that with the intravenous injection of antitoxin there is more danger of anaphylactic shock. But when diphtheria infection has not been recognized until the third day of the disease and especially in patients with laryngeal diphtheria the danger from anaphylaxis is insignificant compared with the danger from the disease itself.

SUMMARY

(1) In spite of the fact that we possess sufficient knowledge to eradicate diphtheria it is still one of the most important of the infectious diseases of childhood.

(2) The carrier is the chief source of dissemination but we have no means at present by which healthy carriers may be identified and they could not be restrained if they were recognized.

(3) It seems evident that since the proportion of convalescent carriers is so small their restraint has no effect upon the incidence of the disease.

(4) By means of the Schick test the susceptibility of individuals at the different age periods has been studied; it has been ascertained that nearly all adults are immune, and the new-born infants of immune mothers are not susceptible.

(5) This congenital immunity is of relatively short duration; susceptibility mounting rapidly to about the fourth year of age.

(6) This corresponds closely with the relation between age period and mortality rate;

about 75 per cent of the deaths from diphtheria occurring in children under five years of age.

(7) By the injection of the three doses of the toxin-antitoxin mixture whose administration is entirely harmless, 97 per cent of the susceptible individuals may be rendered immune to the disease and this immunity will last for three or four years, or throughout the period of greatest susceptibility.

(8) With measures so simple in their application and without any disagreeable complicating or side effects, this would seem to constitute a measure which ought to be strongly recommended by the family physician to all parents.

(9) In the administration of antitoxin, the route of injection to be preferred will depend upon the day of disease and its severity together with the location of the lesion.

(10) Subcutaneous injection results in slow absorption; the intramuscular route is more rapid, while intravenous injection brings the antitoxin into immediate contact with the toxin circulating in the blood.

(11) A single initial dose of sufficient size for the entire treatment is to be preferred upon both therapeutic and practical grounds.

DISCUSSION:

Henry Enos Tuley: Dr. Hitchens mentioned several important features in regard to the Schick test which are very interesting and new to me, especially the different shades of reaction to be expected and the necessity of control injections. Another valuable suggestion is the intravenous injection of diphtheria antitoxin, particularly the initial dose. We had quite an epidemic of diphtheria in Louisville during the past winter and distributed more antitoxin through the city hospital than ever before. From the standpoint of economy, if there were no other reason, the intravenous method of using antitoxin, as stated by the essayist, is well worthy of consideration; and if it is more effective when introduced in that way, which seems to be true according to the statistics, then the intravenous rather than the subcutaneous or intramuscular route should be chosen. The initial dose may be smaller in amount and repetition is often unnecessary; these are features of great importance.

W. H. Pritchett: For some unexplained reason the majority of physicians seem to be afraid to use large doses of antitoxin, or to inject antitoxin intravenously; and, as stated by the essayist, one of the most important features is education, which in this instance means beginning with the doctor first of all.

In the isolation ward of the Louisville Public Hospital we receive many diphtheria patients who have had very small doses of antitoxin. An

attack of diphtheria in young children is oftentimes entirely overlooked, and frequently such patients are not sent to the hospital until they have had the disease for three or four days.

The average physician often has difficulty in managing families with several children where one develops diphtheria, as many people object to the use of antitoxin for purpose of immunization. Strange as it may seem, recent text books on pediatrics devote little attention to the immunization of infants against diphtheria. This is important because, as the essayist has shown, infants between one and two years of age are more susceptible to the disease than are older children.

B. J. O'Connor: Instead of the Schick test having been adopted by practically every institution as stated by the essayist, in this section of the country at least, I think it is something relatively new. Less than a year ago I found it impossible to obtain the toxin for a Schick test from any druggist in the city of Louisville.

The Schick test is a measure in preventive medicine which should receive our most serious consideration. The test is very simple and I see no reason why it cannot be made generally applicable in private practice just as the essayist states is being done in institutions.

I have administered antitoxin intravenously in three cases, two of laryngeal diphtheria and one of severe nasal infection, and think the method has several advantages over the older plans. In one case a single dose of 5000 units was all that was required; in the others a second or a third dose had to be given.

I do not hesitate to give antitoxin, on account of the fear of anaphylaxis, whenever it is necessary as a curative measure. The danger of anaphylaxis especially in young children is so slight that it is hardly worth considering. Unless the patient has had a previous prophylactic dose, the use of which has been abandoned, we should not hesitate for fear of anaphylaxis. If the case is serious, or of several days' standing, use the antitoxin intravenously.

C. H. Harris: Immunity is divided into three types: (a) natural, (b) artificial and (c) acquired. Natural immunity may be illustrated by the well-known fact that the negro is immune to yellow fever. Just why the negro living in the South, where the *stegomyia fasciata* has its habitat, does not have yellow fever can only be explained on the basis of natural immunity. Artificial immunity may be illustrated by vaccination against smallpox. When an individual is vaccinated with smallpox vaccine he is virtually given smallpox in a modified form; and as one attack protects the individual against another he is said to be immune after vaccination. Acquired immunity may be illustrated by the fact that one is immune to certain diseases after having had

them. For example, one attack of scarlet fever, measles, pertussis, typhoid fever, smallpox, etc., usually protects the individual for life. The original meaning of the word diphtheria is, "I deposit," that is the deposition of material which forms an exudate; but diphtheria as we now understand it means much more than this, it means the most virulent toxin which can be introduced into the human system. There is nothing which so overwhelms and devitalizes a susceptible individual as does an attack of diphtheria.

A peculiar thing about the medical profession, and I say this to the shame of some of them, is that they refuse to give antitoxin in the treatment of diphtheria "fearing it will paralyze the heart." There is no greater fallacy in the world than this. It is the action of the virulent toxin upon the vital centers of the individual that does the mischief. Thirty years ago, long before the introduction of antitoxin, nearly every child with severe laryngeal diphtheria perished because of mechanical obstruction to the larynx or from toxic poisoning. In those days many people refused to permit tracheotomy which might have saved life in some instances. Later intubation came into vogue which was not objected to so seriously and many children with diphtheria recovered.

When you give a child diphtheria antitoxin you are doing exactly what the child is trying to do for itself; that is, introducing a substance to neutralize the toxin of the disease. Every child recovering from diphtheria without antitoxin makes sufficient antitoxin of its own to neutralize the toxin present.

I have always feared anaphylaxis as no one seems to know just what it is; but whatever it may be it gave me the greatest scare of my life. A patient in my family was given an immunizing dose of 1000 units of antitoxin. Later she developed diphtheria and was given an initial dose of 10,000 units of antitoxin which had to be repeated. For about fifty hours she suffered from the most violent reaction I have ever seen and death seemed imminent. I am afraid of anaphylaxis and hope the essayist in closing will tell us something more about it.

A. R. Bizot: At the outset I wish to state that I believe in large doses of antitoxin. However, I am afraid of anaphylaxis and have had three experiences like that mentioned by Dr. Harris. I gave one child with diphtheria 10,000 units of antitoxin and 1000 unit doses to three other children in the family for immunizing purposes. The three children to whom immunizing doses were administered one after the other developed diphtheria and I gave each 10,000 units of antitoxin with but little reaction. The dose was repeated within twenty-four hours and was followed by the most violent reaction I have ever seen. One of the children died. Call it anaphylaxis or whatever you wish, but I believe immunizing doses of

antitoxin are not devoid of danger provided the child later develops diphtheria and further antitoxin has to be administered.

Stuart Graves: I would merely like to ask whether Dr. Hitchens would give the toxin-antitoxin mixture to a child under four years of age? How long does immunity last from the administration of antitoxin alone? How soon after the use of antitoxin as a prophylactic does the Schick test become positive? Have any cases of true diphtheria developed in children where the Schick test was negative?

A. Parker Hitchens, closing: It is true that children acquire immunity to diphtheria as shown by the diminishing susceptibility rate. A plausible explanation of this fact is that children may have mild attacks of the disease which are not recognized. That is, given a child susceptible at the age of two years and immune at ten, one can easily imagine that such a child may have actually been infected several times and immunity has been acquired through these mild attacks of the disease.

The most of us are familiar with the investigations which have been made in the army concerning the susceptibility of various individuals to infectious diseases. Vaughan has particularly shown that city recruits were less susceptible to infections while in the army than were those from the country. The most reasonable explanation of this fact is that city boys are more intimately associated with "all sorts and conditions of men" (and also women according to statistics) and in consequence become immune to many types of infection. Unfortunately, however, there are certain diseases to which they do not become immune. The relative immunity of adults to diphtheria is probably due to mild infections in earlier life.

The immunity conferred by the injection of diphtheria antitoxin is of short duration, although the Schick test becomes negative and may remain so for a variable period. For instance, it may remain negative only eight or ten days in certain children and six weeks in others, the average being less than four weeks. The experience of military surgeons in France demonstrated that the passive immunity from injection of tetanus antitoxin did not persist longer than eight days. Therefore when a soldier had a suppurating wound and tetanus seemed likely to develop, tetanus antitoxin was repeated at intervals of eight days. And if one were to depend upon diphtheria antitoxin for immunity, it would be necessary to limit the intervals to about fourteen days. We must remember that diphtheria antitoxin is horse serum which is a protein substance foreign to the human body. When this protein comes in contact with the body cells the tissues make every effort to eliminate it and the pro-

cess of elimination is practically completed within two weeks.

It has been suggested that the second dose of antitoxin, given after two weeks or more, is probably not as effective in producing immunity as the first dose, because the second dose is eliminated more rapidly than the first, and for some reason more trouble seems to follow the second, third or fourth dose. There is simply created in such cases an anaphylactic or allergic state in which the elimination of antitoxin is more rapid.

I believe physicians generally are becoming more and more opposed to the administration of immunizing doses of 1000 units of antitoxin to uninfected members of the family. If they are carefully watched and one develops sore throat or shows the slightest sign of membrane formation it is only necessary to then inject antitoxin and the danger of anaphylactic shock is avoided. Certainly if I were attending a child in a family I would not immunize the other children but would wait and administer antitoxin the moment any of them began to show symptoms. As a matter of fact it is well-known that the immunity conferred by one attack of diphtheria is of comparatively short duration, and a child who has had the disease previously may be just as susceptible as before. The fact that the child had diphtheria shows that it was not naturally immune, and it may or may not acquire immunity as a result of the attack. Such children should be subjected to the Schick test and be immunized if found susceptible or when they become susceptible.

After listening to one of Vaughan's interesting papers it seemed to me that it would be feasible to check the point to which he called attention, i.e., in regard to the degree of the susceptibility of city and country people. I therefore asked Dr. J. N. Hurty, Secretary of the Indiana Board of Health, to allow us to institute in the state of Indiana a campaign of education, which might require three years or more, and demonstrate to the people that the Schick test was harmless. We are making a state-wide survey to ascertain the susceptibility of school children to diphtheria and after obtaining the figures will compare the percentages found in the country and in city schools. Incidentally, we shall urge immunization of susceptible children and in that way create a favorable sentiment among the people which should be of value in the prevention of diphtheria. Anti-diphtheria immunizations have already been successfully practiced in New York City, Philadelphia, and various other cities throughout the country.

As to the danger of the toxin-antitoxin mixture: I think there is absolutely nothing to fear at present. The output of all the laboratories is carefully tested and checked. I have little fear of the so-called negative phase. If a child al-

ready infected is injected with the toxin-antitoxin mixture we have simply given him a therapeutic dose of non-specific protein and may limit the infection. When we speak of fearing the negative phase following injection of typhoid vaccine into persons already infected, or in the prodromal stages of typhoid fever, we have to meet that fear the fact that even when typhoid fever is well-developed a full immunizing dose of typhoid vaccine is not contraindicated. There may be a severe reaction but the only result to the patient is marked benefit. I believe the same reasoning may be applied to the introduction of toxin-antitoxin in patients already infected.

There has been one small outbreak of diphtheria among children showing a negative Schick test. Of course, there has never yet been anything developed to which exceptions could not be found. Robinson, of the Johns-Hopkins School of Hygiene, has expressed the opinion that there must be a strain of diphtheria bacilli which will produce a toxin not neutralized by ordinary diphtheria antitoxin. We have types of pneumococci, of meningococci, etc., and I suppose we shall soon have to "type" diphtheria bacilli and have "poly-types," of antitoxin.

Anaphylaxis is one of the most difficult things we have to approach at the present time. There is little to fear from the second immunizing dose of antitoxin so far as a fatal outcome is concerned. Most if not all the sudden deaths occurring after subcutaneous injection of horse serum in diphtheria, tetanus, streptococcal infection, etc., have followed the first dose. When such cases were carefully investigated it was found the persons who died suddenly were known to be intolerant to the proximity of horses. A few years ago Miller, of the Parke, Davis and Company Laboratory, published a paper along this line and reported thirty-four cases which he had been able to follow carefully. It was shown that many of these persons had asthmatic attacks when near horses. Before injecting a patient with antitoxin for the first time we should ascertain whether that person has hay fever, asthma, "strawberry rash," or other phenomena indicating hypersusceptibility to foreign protein, and if so the injection should not be made unless absolutely necessary as a life-saving measure. If the individual has received antitoxin before and developed nothing more than an urticaria we are perfectly safe so far as life is concerned in injecting the second or third dose subcutaneously provided the quantity be not too great. The patient may suffer considerable discomfort from urticaria, edema, etc., but the danger of sudden death is not great. That the so-called "serum sickness" phenomena are more common after the second injection has been questioned by many observers. Any symptoms which develop within twelve hours after the injection are important. There are cases on record where urticaria was

noted shortly after removal of the needle from the subcutaneous tissue.

When intravenous injection is contemplated, in persons previously injected with horse serum, the procedure is contraindicated unless measures are taken to desensitize the patient. Several authors have given specific directions for the desensitization of susceptible individuals. For example, Wilde's method is the intravenous injection of serum in gradually increasing doses. His first dose is 1-100 c.c., diluted in 5 to 10 c.c., normal saline solution. After about an hour he injects $\frac{1}{4}$ c.c., then $\frac{1}{2}$ c.c., etc., gradually increasing the quantity to 1 c.c. When this point is reached it is his opinion full doses can be administered without danger. Redfield's method does not differ in any essential respect from the foregoing. At the last meeting of the American Association of Bacteriologists and Pathologists this question was discussed and some widely divergent views were expressed. It seemed to be the opinion of the majority that we do not yet know whether we can desensitize a susceptible individual or not. However, if the patient has previously been injected with antitoxin and we contemplate intravenous introduction I believe it is advisable to make the attempt. Even after intracutaneous injection of antitoxin if a severe reaction occurs within a few hours further administration should be withheld unless the patient's life seems in danger. Before introducing antitoxin by the intravenous route, then, we should always ascertain whether or not there is an idiosyncrasy toward any foreign protein, and whether antitoxin has been injected before. In either event at least before administering antitoxin intravenously we should give an intracutaneous dose and if the reaction is positive within a few hours measures should be adopted to desensitize the patient.

Stability of Benzyl Alcohol Solutions.—Various specimens of benzyl alcohol solutions were sealed in ampoules made of different kinds of glass, and such solutions were examined by Macht and Shohl at intervals of time in regard to their anesthetic efficiency on the one hand, and their hydrogen-ion concentration on the other. Solutions of benzyl alcohol kept in nonsoluble glass preserve their anesthetic properties completely for long periods of time and such solutions tend to increase their hydrogen-ion concentration very slowly. Benzyl alcohol solutions kept in soft glass or alkaline containers tend to become alkaline in reaction and rapidly deteriorate in their anesthetic efficiency. It is suggested that the best method of preserving benzyl alcohol solutions is to prepare such solutions from a benzyl alcohol free from benzaldehyde, and to seal the same after the addition of a buffer solution in hard glass ampoules.

INJURY TO THE WRIST; CASE REPORT*

By J. GARLAND SHERRILL, Louisville.

I have a patient here I would like to present and will read the history before he is brought in. Mr. A., aged 20 years, on November 5, 1920, was brought to me with the history of an injury to the dorsal surface of his hand while repairing a boiler. It seems one of the pipes of the boiler was quite heavy and fell on his hand, cutting the dorsum of the right wrist.

This man came to me with a wound two inches long on the dorsum of his right wrist which extended into the joint. The superficial artery, the radial nerve and five tendons were severed on the posterior aspect of the joint. Pain was marked and bleeding severe when his doctor saw him. Hemorrhage was temporarily controlled when he came under my care.

Assisted by Dr. I. A. Arnold, a careful cleansing of the wound was made, which was covered with dark, dirty material, and we searched each tendon in turn and also the nerve and sutured the ends in position. The wound was closed without drainage.

The hand was kept in a splint for five weeks or more, but it was removed at intervals, and slight passive motion employed at the end of two and a half weeks. The reason the splint was left intact so long was because we did not care to put any particular strain or weight-bearing on the tendons which had just been united.

At first the man was absolutely unable to extend his hand at the wrist or to extend any of the fingers, but his nerve power was restored and he was gradually able to get extension. I believe at the present time, a little over three months following the injury, he is able to extend all but two fingers, and I think extension in these two fingers is better than it was at first. Sometimes it takes a number of months for complete restoration to take place. In some instances it is necessary to make a later coaptation of the nerve fibers in order to get a good result. This man has been allowed to use his hand over a rubber ball.

The results thus far are encouraging, and I believe the patient will eventually get good function of his hand.

*Clinical report with exhibition of patient before the Louisville Medico-Chirurgical Society.

DISCUSSION:

I. A. Arnold: I was fortunate enough to see this patient with Dr. Sherrill. The wound had not become infected, but it was filled with dirt, soot, or something which made it perfectly black and difficult to get clean. We brought the tendons into correct apposition and I think the result is excellent.

The trouble the man has now with the fingers is due to the injury to the radial nerve. He has good function of the tendons, but the radial nerve supplies three fingers and has not had sufficient time to restore function in the finger tips. Flexion is obtained through the median nerve.

L. W. Frank: This is a very interesting case. It must be remembered that below the site of this injury the radial nerve has no branches that supply any muscles, consequently sensation is the only thing that is served by the radial nerve at that level. The impairment of function is due to the tendon injury. Sensation has partially returned in this case. We know that the nerve regenerates at the rate of about one millimeter a day, and that is well shown in this case.

It may be interesting, in this connection, to mention a case coming under my observation in September, 1920, in which the first cord of the brachial plexus was severed and the man had complete paralysis of the deltoid muscle, biceps and *craniatus anticus*. Dr. Embert Thompson, who has been observing the regeneration of the nerve, stated yesterday that the man can now abduct his arm to about one-half the normal extent and can also flex the forearm. It has been more than four months since the receipt of the injury and it has taken that length of time to get regeneration the distance mentioned. Sensation returns long before motor power, consequently we are gratified to obtain even this result.

In the case reported by Dr. Sherrill I think the man will ultimately have a useful hand.

Robert T. Pirtle: I wish to say a few words with reference to the after treatment in cases of this kind. This patient's hand is now at a stage where massage, heat and passive motion will improve his condition a great deal. The hand of a working man especially which has been kept in a splint for five weeks will have more or less deformity of the joints following fixation, and it has been my experience that function will return earlier by the application of massage, heat and passive motion.

Determination of Blood Chlorids.—The method of preparing protein-free filtrates by the use of tungstic acid, as developed and used by Folin, was applied by Whitehorn to the determination of urine chlorids are employed. The limit of error is less than 1.5 per cent.

CASE OF ACUTE COMMUNICATING
HYDROCEPHALUS*

By

HENRY ENOS TULEY
JOHN WALKER MOORE

L. R. ELLARS

Louisville.

Internal hydrocephalus has for so long been the subject of study that newer methods of diagnosis and therapeutic suggestions which offer some hope of cure in certain types should be welcomed by the profession. Having recently had under observation a child with acute hydrocephalus it has occurred to us that a report of the case, with a review of the pathology and description of the latest method of diagnosis, should prove of interest to the members of this society. I will briefly report the clinical history of the case, Dr. Moore will present the pathological aspects, and Dr. Ellars will speak of the x-ray diagnosis.

R. O. H., aged four months, admitted to hospital May 8, 1920, was an only child, and the mother gave no history of miscarriages. The baby was nursed entirely at the breast for two months when it became acutely ill with what was thought to be influenza. On the fourth day of the illness there was a sudden rise of temperature to 104 degrees F. with indications of acute cerebro-spinal meningitis. The outstanding symptoms present were: a drawing backward of the head, rigidity of the neck, positive Kernig and Babinski signs, with entire loss of motion in the left arm and forearm. The latter symptom persisted for about three weeks, and the fever gradually subsided during that period. From this time improvement was satisfactory with gradual return of the arm motion to normal.

Three or four days before admission to the hospital the mother noticed that the child's head was larger than normal, and it was thereafter noted that the anterior fontanel showed a decided bulging, there was also separation of the sutures and prominence of the occipital region.

The child weighed at birth ten pounds and was apparently normal in every way, being able at the age of two weeks to "hold up its head." After breast feeding was discontinued Horlick's malted milk was used. The mother stated that one week before admission the child began to have difficult and irregular breathing which evidently approached Cheyne-Stokes in character. The child coughed frequently

and quantities of mucus raised occasionally would escape from the nose and mouth.

Examination shows an emaciated baby with very large head, slight tendency toward deflection of both eyes so the superior scleral margins are exposed when eyes are wide open; the child lies upon its back but its head rotates to either side; it does not lie upon the occiput at any time; there is Cheyne-Stokes respiration; loud rales both moist and dry are heard over the entire chest; many of these sounds seem to be transmitted from the larynx; there is a mild Babinski and Kernig on both sides, the Kernig being more marked on the left. The child uses the left forearm but is apparently unable to use left arm. The anterior fontanel measures $2\frac{1}{8}$ by $2\frac{1}{4}$ inches; posterior frontal $\frac{1}{4}$ by $\frac{1}{4}$ inch. The sagittal suture is one finger's breadth wide over its entire course.

On May 8 the ventricle was tapped and 170 c.c. of colorless fluid withdrawn. There was no reaction following this procedure. Air was injected (as will be shown by Dr. Ellars) immediately after removal of the fluid.

After the ventricular fluid was removed the first time and the air injected, an injection of neutral phenol-sulphonephthalein was made into the ventricle, and an attempt made thirty minutes later to obtain some spinal fluid by spinal puncture. No fluid was obtained but air escaped through the spinal puncture needle, showing definitely that there was a communication between the ventricles and the cord.

On May 13 withdrawal of 125 c.c. of slightly blood-tinged fluid was followed by a decided reaction. The child became pallid, vomited considerable mucus for several days, and there followed a temperature of 103 degrees F., lasting for about three hours. The child left the hospital in about the same conditions as upon its admission.

Diagnosis: Acute communicating hydrocephalus.

CLASSIFICATION AND DIAGNOSIS.

To properly understand the mechanism of hydrocephalus it is necessary to review the formation and absorption of the cerebro-spinal fluid, the anatomy of the spaces and cavities which normally contain this fluid, etc.

The arachnoidal cavity envelops the brain and cord and occupies the space between the pia mater and the arachnoid. The pia, the innermost lining of this cavity, is a vascular membrane and invests the entire surface of the brain and cord, extending downward between the convolutions of the former and prolonged into the interior forming the choroid plexuses of the lateral and fourth ventricles.

In contrast to the pia mater, the arachnoid, a delicate membrane, passes over all the

depressions of the brain surface, not only the fissures but also the deep groove and cavities at the base of the brain. Thus, it is obvious that over the convolutions of the brain the laminae lie close together, whereas over the sulci they are more or less widely separated. The wide recesses of the subarachnoid space are situated at the base of the brain and are known as the subarachnoidal cisterns.

Of these the following bear special names: (1) Cisterna magna (posterior subarachnoid space). It is the largest subarachnoidal space; it is formed by the arachnoid passing across the posterior and inferior portions of the medulla and cerebellum. This portion of the arachnoid is a continuation of the posterior part of the arachnoid of the cord. The roof of the fourth ventricle has three apertures, and it is through these foramina that communication is established between the ventricle and the cisterna magna. (2) Cisterna pontis (anterior subarachnoid space). It is a continuation upward of the anterior part of the subarachnoid space of the cord and located over the pons. (3) Cisterna basalis encloses the circle of Willis and is formed by the arachnoid extending between the two temporal lobes.

The cavities of the brain likewise bear special names: the lateral, third and fourth ventricles. These cavities are so familiar to the profession that we need merely refer to their anatomical relations. The lateral ventricles are connected with each other and with the third ventricle by the foramen of Monro; the third with the fourth ventricle by the aqueduct of Sylvius; the fourth with the cisterna magna, as I have just said, by three apertures penetrating the roof of this ventricle. Of these apertures the central one is known as the foramen of Magendie, whereas the two lateral ones are known as the foramina of Luschka. Situated within each cavity is a highly vascular fringe-like structure, the choroid plexus. It is to this highly specialized structure the majority of the present-day writers attribute the source of the cerebro-spinal fluid.

What becomes of the cerebro-spinal fluid which is formed in the ventricles? The fluid gains entrance into the subarachnoid space of the brain and cord and is absorbed directly into the blood stream. Experimental evidence shows that less than one per cent is absorbed within the ventricles. Four-fifths of the fluid is absorbed while in the subarachnoid space of the brain, whereas about one-fifth is absorbed in the subarachnoid space of the cord.

As we have attempted in the foregoing remarks to show the paths for circulation of the cerebro-spinal fluid, the place and manner

of the formation and absorption of this fluid, we can best present the modern conception of hydrocephalus.

Hydrocephalus is secondary to some process which interferes with normal circulation and absorption of the cerebro-spinal fluid. The majority of the cases, therefore, will come under one of two headings: (1) Communicating hydrocephalus, and (2) obstructive hydrocephalus.

In communicating hydrocephalus the cerebro-spinal fluid may pass freely between the ventricles and the subarachnoid space of the cord and the base of the brain, but obstruction in the form of adhesions obliterates the various cisternæ about the base of the brain thereby preventing the circulation of this fluid in the subarachnoid space over the cerebral hemispheres where absorption occurs fourfold. Therefore, as Dandy states, communicating hydrocephalus is due not to a reduction in the avenues of communication between the ventricles and the subarachnoid space, but to a blocking of the primary trunks of the subarachnoid space, thus preventing the cerebro-spinal fluid from passing to the branches. On the other hand, if all three of the foramina are closed, and there be no communication between the ventricles and the subarachnoid space, we are dealing with a type known as obstructive hydrocephalus. Of course occlusion of the aqueduct of Sylvius, or the inter-ventricular foramen causing unilateral hydrocephalus is classed under the obstructive type of hydrocephalus. In short, there is little difference fundamentally in the two types, viz., communicating and obstructive, for in the former the obstruction is in the subarachnoid space of the brain and in the latter the obstruction is in the ventricles. Nevertheless, from the standpoint of treatment, it is essential to differentiate between the two types.

The differentiation between communicating and obstructive hydrocephalus is well-nigh impossible based upon the clinical signs alone, the symptoms produced being essentially similar. However, the two types can be differentiated by the phenolsulphonaphthalein test. When one cubic centimeter of neutral phenolsulphonaphthalein is injected into the ventricles in obstructive hydrocephalus the dye does not appear in the cerebro-spinal fluid obtained by lumbar puncture within forty minutes if at all; less than one per cent of the dye is absorbed in two hours. On the contrary, in a patient with the communicating type (or in normal individuals) the dye appears promptly (six to twelve minutes) and eight to ten per cent is excreted in the urine within two hours. When one cubic centimeter of phenol-

sulphonaphthalein is injected into the subarachnoid space of the cord in normal individuals, thirty-five to sixty per cent of the dye is excreted in the urine within two hours. In communicating hydrocephalus less than twenty per cent is excreted in the urine within two hours, whereas in obstructive hydrocephalus, if the cisternæ and the meninges are not affected, absorption is as prompt as in normal individuals.

If the foregoing test is properly made it establishes accurate information regarding the patency of the foramina between the ventricles and the subarachnoid system and the amount of absorption from the subarachnoid space.

Another method that is at times helpful in differentiating the type of hydrocephalus, though not always successful, is by determining the quantity of fluid which can be withdrawn from the spinal subarachnoid space. In the communicating type by repeated taps at frequent intervals one often recovers a large quantity of cerebro-spinal fluid; whereas in the obstructive type one may obtain a fairly large quantity of fluid at the initial puncture, but with frequent following taps one may obtain only a few drops if any.

Still another method of diagnosis is by injecting air into the lateral ventricles. This method will be discussed in detail by Dr. Ellars.

THE X-RAY IN HYDROCEPHALUS.

Through the efforts of Dr. Walter W. Dandy, of Johns-Hopkins University, in advancing the idea of air injection into the ventricles and spinal canal for x-ray purposes, we now have an accurate and apparently harmless way of diagnosing internal hydrocephalus in the early stages before much cortical change has occurred and also the degree of same if any. The technique of the procedure is as follows:

Under the strictest asepsis a small lumbar puncture needle (attached to a 10 c.c. Luer syringe by means of coupling and small rubber tubing) is passed through the anterior fontanel into the ventricle far enough laterally to avoid puncturing the longitudinal sinus. Suction is made on the syringe during the puncture so that fluid will appear in the barrel the second the point of the needle enters the ventricle.

The head of the patient is then placed in an oblique position with the external angular process of the frontal bone downward so as to make the needle puncture the lowermost part of the ventricular system. Fluid is then aspirated, 10 c.c. at a time, and an equal amount of air injected. Exact control can be had over this by clamping and releas-

ing the rubber tube between the needle and the syringe with an ordinary hemostat.

Air and fluid in the ventricle behave exactly the same as they do in a closed bottle, consequently fluid will gravitate to the most dependent portion forcing air to the uppermost part.

On account of the peculiar curvatures of the ventricular system it is impossible to get complete drainage unless the head of the patient is tilted from side to side frequently and then placed in an oblique position so as to allow the fluid in the various recesses to gravitate to the most dependent portion where puncture has been made. We have no way beforehand of estimating the amount of fluid present, and the amount we wish to withdraw, so it has been our custom to remove all the fluid possible.

After the injection of air is made the head of the patient is placed in a head-clamp keeping the anterior part downward, and an x-ray plate placed underneath and exposed, thus giving an outline of the posterior horns. The head is then placed on the occiput, right and left sides, and plates made, thus outlining the anterior horns, and the left and right ventricles respectively. We believe an important point here is to allow the head to remain in a given position for a least twenty minutes before the exposure is made, so that the fluid will have had time to seek its level and thus empty as much as possible the ventricle we wish to photograph.

Hydrocephalus is now divided into two types: communicating and obstructive, and the x-ray gives valuable information in differentiating the two.

The technique of this procedure is to make an ordinary lumbar puncture with the apparatus described and withdraw the spinal fluid, 10 c.c. at a time, and inject an equal quantity of air, the head of the patient being at least 20 degrees higher than the needle.

In the communicating type air passes into the lateral ventricle, thus demonstrating the patency of the foramina of Magendie and Luschka, the aqueduct of Sylvius, and the foramen of Monro.

In the obstructive type the obstruction can at times be located by the fact that the air will meet with a definite obstruction and fail to enter the subarachnoid space and various cisterna of the brain.

DISCUSSION:

John J. Moren: In connection with the case reported by Dr. Tuley, I am reminded of a girl aged twenty-one, who came under my observation several years ago. She was supposed to have a brain tumor and her condition was considered hopeless. She had choked disc, and vertigo was

extremely annoying. One day she fell at her home and sustained a severe jolting. From that day she began to improve and is now apparently a perfectly normal woman. I believe she had obstructive hydrocephalus and the jolt in some way separated the adhesions thus permitting restoration of the normal circulation of cerebro-spinal fluid.

The diagnostic work which has been outlined is valuable, but nothing seems to have been accomplished in a therapeutic way. That is a sad part of the story. As an illustration: not long ago I saw in consultation a child with internal hydrocephalus. A local surgeon undertook an operation for relief and the child died on the table. The diagnosis of internal hydrocephalus was verified at autopsy.

I understood Dr. Tuley to say that his patient gave the history of sudden acute illness. Patients are quite frequently referred to me with such a history three to seven years after the initial attack which the family physician diagnosed as "brain fever." Unfortunately little can be done for such patients in the later stages.

The demonstration we have had tonight shows that certainly the diagnosis can be made, but I am still pessimistic as to anything being accomplished by any method of therapy in these cases.

L. W. Frank: I had the opportunity of doing some work in the diagnosis of hydrocephalus with Dr. Frazier about two and a half years ago. We used only the phenolsulphonephthalein method of study, that is by injecting the ventricles and spinal canal with the dye and testing the cerebro-spinal fluid and urine for its presence. In one case coming to autopsy after three injections—a hopeless case of hydrocephalus in which no dye had appeared in either the cerebro-spinal fluid or urine—we found a large percentage of the dye injected had remained in the ventricle.

The method of diagnostic study described tonight is a great advance in the study of this condition and may give us some idea in regard to the treatment of these cases. In obstructive hydrocephalus numerous drugs have been recommended and tried for inhibiting the formation of fluid by the choroid plexus, and in certain instances the secretion was diminished and in that way some good was accomplished.

In non-communicating types of hydrocephalus there is little that can be done in the way of treatment. In the communicating type better results have been obtained, but in any event treatment must be instituted early before extensive cortical changes have occurred.

In the case reported by Dr. Tuley I understand no dye nor even cerebro-spinal fluid could be obtained when the second spinal puncture was made. Under these circumstances I would like to ask how he definitely concluded there was a communicating hydrocephalus?

J. G. Sherrill: There has been considerable work done in regard to the treatment of hydrocephalus. It has been my experience that some mild cases recover practically without treatment; others do not improve under any method of management; in quite a number of cases some relief has been obtained by tapping the ventricle. In certain cases I have followed the suggestion of Krause and others and tried to drain the ventricle by transplanting a vein in the soft parts into the ventricle through an opening made in the skull. For the most part this method has been unsuccessful. I doubt whether there is any great probability of a satisfactory treatment for hydrocephalus being evolved in the near future.

The discussion of this subject, however, leads to another phase of brain surgery wherein I believe Dandy has accomplished something. He claims, but whether correctly or not we do not know, that lesions in the so-called silent area of the brain can be positively localized and differentiated by the method he has devised. If this proves true it will make recognition and removal of certain brain tumors more readily accomplished and will do much to clarify a very dark page in the history of surgery. Dandy is very enthusiastic and has done some valuable work, and undoubtedly his method will eventually find its proper place in surgery. As Dr. Ellers has shown, and as stated in the paper which I read before the last meeting of this society, the method can be employed with a reasonable degree of safety. Dandy says it is not entirely devoid of danger. He has reported a number of cases where the method was used without the production of symptoms to cause alarm. The method ought not to be used, however, except by skilled observers, and only in cases where it is not contraindicated.

H. E. Tuley, closing: The probable reason why no fluid was obtained after the first spinal puncture in the case reported was that air introduced into the ventricle, prior to attempting the phenolsulphonephthalein test, occupied the subarachnoid space of the cord. However, that air was withdrawn in making spinal puncture seems sufficient evidence that there existed a communicating hydrocephalus.

Dandy's theory is that by early recognition and diagnosis of these cases with removal of the choroid plexus from the floor of the lateral ventricle the production of fluid will not be out of proportion of its absorption. He makes a small opening in the parietal bone and removes the choroid plexus through a special speculum.

This child was seen within a week after the symptoms were first noticed. I immediately telegraphed to Dr. Dandy asking his opinion as to the advisability of operative treatment. The family at first seemed willing to take the child to Baltimore for treatment, but later changed their mind.

Dr. Dandy replied that as the patient was seen early his operation might afford some measure of relief.

As Dr. Moren has stated, in the majority of cases of hydrocephalus in older individuals careful inquiry will reveal an early history of "brain fever," or meningitis. In nearly all cases, unless purely congenital in type, there is a history of acute (obliterating) inflammatory cerebral disease which most likely caused a lack of balance between formation and absorption of the cerebrospinal fluid. In this case the disease had not existed long enough to cause extensive destruction of brain tissue, and I believe the patient would have been able to recuperate provided the Dandy operation could have been performed.

John W. Moore, closing: As to the diagnosis in case reported: We believe we were justified in making a diagnosis of communicating hydrocephalus from the following findings, (1) air in spinal subarachnoid space, and cisterna magna, (2) absence in 24 hours of phenolsulphonephthalein in lateral ventricles.

I think Dr. Tuley's explanation is sufficient to account for the failure of obtaining the dye in the spinal fluid thirty minutes following its injection into the lateral ventricles.

L. R. Ellars, closing: In performing his operation Dr. Dandy makes a small trephine opening and operates through a special speculum. With long forceps he places a small silver clamp on each end of the choroid plexus of the lateral ventricle which is then torn from its attachments and removed.

Neurosyphilis.—Of the series of 100 cases analyzed by Eckel, forty-four (44 per cent) were cases of tabes dorsalis, and of these 30 per cent occurred among females and 70 per cent among males. The earliest occurred at the age of 31 and the oldest at 58. The probable date of the onset of symptoms from the date of the initial lesion, as best estimated from the history of the patient, varied from three to twenty-one years with the average at eleven years. Of the forty-four cases of tabes, twelve were advanced, thirteen moderately advanced, and nineteen were in the early or incipient stage. Of blood Wassermanns done on the tabetics, 45 per cent showed negative, and of these only three became positive after provocative arsphenamin. There were twenty-one cases showing neurasthenic complex with greatly exaggerated reflexes and usually hyperactive pupils easily fatigued; five cases of Erb's syphilitic spinal paralysis; sixteen cases of sciatica varying from subacute to chronic forms with atrophy and paralysis; seven cases of optic atrophy. There were cases showing symptom complexes closely resembling chronic recurring tetany, multiple sclerosis, amyotrophic lateral sclerosis, bulbar palsy, progressive muscular atrophy and one case of syringomyelia.

TOXEMIA OF PREGNANCY; REPORT OF TWO CASES*

By LOUIS FRANK, Louisville.

Mrs. W. W., aged 30 years, came under observation in August, 1920. Her family history was negative. Personal history: influenza in 1917-18; no other illness of consequence.

When about seven and a half months advanced in her first pregnancy she developed intense headache, with high blood pressure, blindness and edema of the lower extremities. At this time she was admitted to the hospital for observation and treatment. Under eliminative measures her condition improved, the headache subsided, blood pressure became normal, and vision returned. About a week later, however, she became worse, she said there were "spots before her eyes," and blindness recurred. Blood pressure was again high (180-120) and edema rapidly increased.

Urinalysis: Urine cloudy; color light amber; reaction alkaline, specific gravity 1011; albumin plus; sugar 0; leucocytes 8 to 15 per field; epithelia a few; erythrocytes 0 to 4 per field; hyaline casts present; no diacetic acid; on acetone. Blood count: Hemoglobin 94 per cent (Dare); erythrocytes, 5,500,000; leucocytes 11,400.

Diagnosis: Toxemia of pregnancy with impending eclampsia. Cesarean section advised and performed August 17, under gas-oxygen anesthesia. There was nothing unusual about the operative steps.

Post-operative course: August 19 the patient still complained of blindness. Blood pressure increased to 186-126 the following day although her general condition was good. On the 21st her eyes were examined by Dr. I. A. Lederman who reported the following findings: pupils slightly larger than normal, but respond quickly to light. Ophthalmoscope: right eye, optic neuritis; moderate edema of the retina; few small hemorrhages, one large hemorrhage (retinal). Left eye, optic neuritis; marked edema of retina and around optic disc and macular region; edema over entire fundus; no hemorrhages visible.

On August 23rd the following one was made: edema of both eyes increased; hemorrhages of right eye in macular region; none in left. Patient had some muscular twitchings and complained of headache. Hot pack applied for thirty minutes.

August 24th the patient complained of

headache and was restless; feet and ankles still edematous; blood pressure 188-130. Blood examination: urea nitrogen, 25 mgs., per 100 c.c. of blood; urea, 53.5 mgs., per 100 c.c., of blood. At this time Dr. Lederman found the pupils widely dilated (cocaine and homotropine); eye grounds same as on the 23rd, with addition of large tortuous veins in both eyes extending some distance from disc, but more marked at disc margins. August 25th hot packs twice applied; blood pressure 182-126.

Blood examination August 26th; urea nitrogen 30 mgs., per 100 c.c., of blood; urea 64.2 mgs., to 100 c.c. of blood. Patient perspired freely in hot packs and felt considerably improved. Blood pressure 152-112.

August 27th edema of retina had decidedly lessened in both eyes; the right showed several small hemorrhages near nasal side of disc, one above and temporally, none in macula. Patient much improved.

August 30th, edema in left eye subsiding rapidly, that in right not so fast; no fresh hemorrhages. August 31st, blood pressure 118-88 and wound healed. Patient discharged from hospital on September 9th. She and the baby have since remained well.

Here we have a case of toxemia of pregnancy which, while responding at first to the therapeutic measures ordinarily employed, there was later a recrudescence of symptoms. Before operating we discussed the possibility of an accouchement force, but believed that would be unwise because the patient was 30 years of age and this was her first pregnancy.

In contrast to the foregoing we wish to mention another patient who came under observation November 24, 1920. Mrs. W., aged 25 years, also a primipara, with negative family history. Personal history: no illness except childhood diseases. Last menstrual period March 15, 1920; delivery expected about December 22nd.

About three weeks previously she had noticed some swelling of her legs and vulva which gradually increased. She did not at that time complain of headache, and the eye findings showed nothing unusual. No marked nausea or other symptoms; fetal movements noted but seemed feeble.

Physical examination showed marked edema of legs and labia. Fetal heart sounds and movements normal. Diagnosis: toxemia of pregnancy (impending eclampsia). Blood pressure 160-100. Blood count: hemoglobin 100 per cent (Dare); erythrocytes 5,080,000; leucocytes 9,800.

November 26th blood examination showed: urea nitrogen 27 mgs., per 100 c.c., of blood; urea 57.78 mgs., per 100 c.c., of blood. Urin-

*Clinical report before the Louisville Medico-Chirurgical Society, January 28, 1921.

alysis: urine cloudy; color amber; reaction acid; specific gravity 1013; albumin two-plus; sugar 0; many red and white blood cells; few granular casts. Ordinary eliminative treatment instituted.

On November 27th the eyes were examined by Dr. J. H. Simpson: No retinitis found in either eye. The patient now complained of severe headache and said "her eyes hurt;" edema still marked. November 28th, eye grounds normal. By the following day the edema had greatly diminished; eliminative treatment continued. Blood pressure 120-75. Blood examination November 30th: urea nitrogen 34 mgs., per 100 c.c., of blood; urea 72.76 mgs., per 100 c.c., of blood.

Under eliminative measures which were employed it will be noted blood pressure decreased and edema lessened, yet the blood urea increased, showing renal deficiency; and in view of this we decided that a Cesarean section was necessary. However, the night prior to the day set for operation labor began and the patient was delivered instrumentally of a living child the following morning, December 1st. There was no serious injury inflicted upon the soft parts during delivery, and both the mother and baby are living and well.

DISCUSSION:

L. W. Frank: To my mind there are two important points suggested to the cases reported. The first is the study of the blood and blood chemistry (which is not infrequently neglected in the toxemia of pregnancy) and the second is the value of an ophthalmoscopic examination. Based on the general symptomatology in such cases one might conclude that it would be safe to allow gestation to proceed, using therapeutic and eliminative measures, etc., in the hope that the patient would go to term and that delivery might be completed normally or with forceps. Our procedure may have to be changed, however, if there is an optic neuritis (which may or may not be increasing) as demonstrated by ophthalmoscopic examination. Where optic neuritis is not present, and where the blood chemistry showed no marked increase of the nitrogenous elements, then it may be safe to let nature take its course. When optic neuritis is present with hemorrhages into the retina, one must decide what method will permit delivery the quickest and with the greatest safety to both mother and child. This is an important decision and should be made only after consultation between the obstetrician and surgeon.

Charles Farmer: I agree with what Dr. Frank has said. Many of these patients with toxemic symptoms during pregnancy can be delivered in the normal way. I recall a patient seen five or six years ago who was very edematous and prac-

tically blind. Dr. Dabney examined her eyes and we both thought labor should be induced. The woman was thirty years of age. She was taken to the hospital and I introduced a piece of gauze through the cervix into the uterus. In about twelve hours labor began and was completed in the normal way. She eventually recovered her vision and has had no further trouble. I believe a great many of these cases can be successfully handled in that way.

George A. Hendon: The most interesting feature to me in connection with these cases of physiological dystocia is the determination that immediate delivery must be accomplished, and when this has been settled there is still left to be determined whether to perform Cesarean section or deliver by accouchment force; and after one has gotten that far in his reasoning he is still left to decide which the woman will bear with the greatest degree of safety. It is a very nice question for surgical judgment to determine whether forceps delivery or Cesarean section will impose the lighter tax on the already damaged constitution of the woman, and so far as I am aware there is no way by which one can reach that conclusion with absolute certainty. I am inclined to think that delivery per via naturales would give the woman the greatest degree of safety in the majority of instances. This route at least possesses the advantage of precedence.

J. Garland Sherrill: I cannot agree with what Dr. Hendon has just said. In a young primipara it is sometimes impossible to decide the relation of the size of the child to the pelvis of the mother; there may be a rigid os or one not well dilated in which event no one can tell the relative size of the child to the pelvic parts; and I believe in that sort of case Cesarean section is easier for the surgeon and safer to both the woman and the child than accouchment force. I must confess that experienced obstetricians can perhaps deliver a woman satisfactorily by accouchment force, but it is not a simple operation to make a hurried delivery; and in case the woman is severely toxic what Dr. Frank has said should be borne in mind; that is, we should have not only the judgment of a competent surgeon but also an experienced obstetrician. I do not believe the man who is doing obstetrics should attempt to perform a Cesarean operation without consultation with a surgeon; nor do I believe that the man who is doing surgery should undertake this operation without consultation with the obstetrician. Therefore, I would insist upon consultation in every case of this kind. I think this plan is much safer for the patient, for the child and for the attendants.

Henry Enos Tuley: I have some very positive opinions upon the subject of the toxemia of pregnancy, and take the same position Dr. Frank has outlined. Given a case of the pre-eclamptic con-

dition in the earlier months, say after the sixth or seventh month, where there is a rigid os and an unengaged head, a condition which makes it practically impossible to effect delivery in the normal way, I consider the high forceps operation one that should never be performed. I think it is an exceedingly dangerous procedure under the circumstances cited. Furthermore, it is almost impossible even after labor has begun, when the os is rigid, to complete dilatation of the cervix and do a high forceps operation without danger of rupture of the uterus.

I would say most positively that in the pre-eclamptic condition developing as late as the seventh or eighth month without any dilatation of the cervix, that in practically every one of these cases Cæsarean section should be performed. When the symptoms of toxemia develop later in pregnancy I believe accouchment force, especially in multiparæ, is probably a safer method, at least it ought to be tried under the strictest aseptic precautions.

Louis Frank, closing: Dr. Tuley has probably expressed my opinion better than I could do it myself. I think between accouchment force with high forceps application and Cæsarean section in primiparæ where the parts are rigid and the os is not softened, that certainly Cæsarean section is much safer for the woman as well as the child.

In these severely toxic cases, particularly where there is much kidney disturbance, we have also the question of anesthesia to consider. It has been my practice to operate in these cases under gas-oxygen anesthesia which I think is probably safer than the administration of ether.

To emphasize the point I endeavored to make in my report: I do not believe that simply because a woman has edema, although it may be quite extensive, that she may show an increase in blood urea, that she may have some headache, that she may have other symptoms indicative of toxemia, that these alone are sufficient to recommend or justify Cæsarean section. We should first try elimination and if the patient does not show any improvement Cæsarean section might then be considered in connection with accouchment force.

When I spoke of injury to the soft parts of course I did not refer to the use of the high forceps. The fear or danger of laceration of the cervix and perineum is absolutely no indication for Cæsarean section; nor do I think the presence of toxemic symptoms of themselves, without reference to degree, is an indication for Cæsarean section.

Chlorids in the Urine in Influenza.—Eisleb reports that the elimination of sodium chlorid in the urine in influenza is like that in croupous pneumonia, which may aid in the differential diagnosis.

MAMMARY CARCINOMA IN FEMALE AGED 22 YEARS; CASE REPORT*

By LOUIS FRANK, Louisville.

In connection with some other cases we desire to report tonight, we present this girl as illustrating an exceedingly interesting class of cases showing the early date at which malignant disease of the breast sometimes occurs.

Mrs. L. M., aged 22 years, has been married four years, and has had three pregnancies; one child stillborn at seven months; another stillbirth in March, 1918. Her menstrual history is normal.

She noticed a tumor in her breast two and a half years ago, which remained stationary, or at least did not increase appreciably in size, until about three months ago. She came under our observation in December, 1920, about two months after the tumor began to increase in size.

The further history states that this tumor did not change in size during menstruation, that she nursed her baby with the tumor in the breast, but as the growth continued she ceased nursing the infant.

When she came to us in December we made the diagnosis of mammary carcinoma. She was subjected to operation on December 9, 1920. The diagnosis of adeno-carcinoma was confirmed by the microscope. The patient is exhibited merely to show that carcinoma of the breast sometimes develops earlier than we have heretofore believed. If I may be permitted I would like to quote from Bloodgood to show the age at which malignant disease of the breast develops:

"Among eight hundred and eighty-five malignant tumors of the breast thirty-five or 3.9 per cent have been under thirty years of age when the lump was first observed. In ten cases the age of onset varied from fifteen to twenty-five years," by which he means during this time the breast was benign. "In six other cases of cancer in which the age of onset was less than twenty-five, the tumors had been observed from five to forty years," thus offering ample time for removal during the benign stage.

There remains but one positive case of cancer originating in a woman younger than twenty-five. This patient was twenty-one years of age and had observed the lump but a few months.

*Clinical report with exhibition of the patient before the Louisville Medico-Chirurgical Society.

DISCUSSION:

J. Garland Sherrill: This is a most interesting case. We know that malignancy of the breast does occur in young women; that it occurs, however, with a considerable degree of rarity is also a well-known fact. If my recollection is correct about eighteen years is the youngest woman reported to have had a carcinoma of the breast. It has seemed to me, from my personal observation, that either we are diagnosing tumors of the breast earlier now, or we are seeing malignant tumors of the breast in younger women than we did formerly.

I think the classification of MacCarty as regards the nomenclature of tumors of the breast is the best that has ever been offered to cover the various classes of tumors found here. It does away with a great amount of the nomenclature that is misleading. For instance, hypertrophic mastitis, chronic mastitis, or the various names of authors that have been given to certain changes that occur in the breast undergoing senile change. Any breast may undergo atrophic senile change although the patient may not be an old woman. However, we see malignant disease of the breast occurring more frequently in women who have borne children than in women who have not borne children. We also see malignant disease more frequently in breasts which have been subjected to traumatism, which have been the site of acute inflammation during the child-bearing period, and where atrophy of the breast has taken place later, than we do in women who have not borne children. Of course, it must not be forgotten that women who have not borne children may have adenomatous tumors of the breast which subsequently undergo malignant change.

A tumor of the breast is always a serious matter, and I believe that every suspicious tumor of the breast ought to be promptly removed, particularly in patients of thirty-five or older. It is perfectly feasible to have a pathological examination made at the time of the operation to determine whether or not there is a strong suspicion of malignancy.

In the pathological examination I believe it is well to follow the classification given by MacCarty, who bases his views entirely on the cell arrangement of breast tumors; in other words, the heteroplastic changes which occur. In the normal breast gland there is a basement membrane on which there is a layer of cells. If this layer of cells merely shows multiplication without any tendency to break through the basement membrane, it is known as primary hyperplasia and is probably a benign growth. If there is considerable tendency to proliferation of the cells which are breaking away from the basement membrane but have not gone through, it is known

as secondary hyperplasia which is very suspicious of malignancy. If the cells have broken through the basement membrane, the tumor is certainly malignant. In one portion of the tumor, however, the first change may be found, in another portion the second, and in still another the third; therefore, it requires a very careful examination of sections removed at the operation to determine whether malignancy exists or not. If there is a strong suspicion of malignancy radical operation should be performed, and only in cases where the growth is certainly benign should be simpler methods of treatment be undertaken.

The method of excision employed by Dr. Frank in the case reported is the one used by the majority of the better surgeons today. He used a modified Halsted incision carrying it above the shoulder thus avoiding a scar in the axillary space. I think this is the plan which should be pursued in every case where the breast is to be excised. The result he has secured is excellent.

It should be the duty of the medical profession to educate the laity on the subject of cancer, and the physician first consulted should be competent to judge as to the malignancy or benignancy of a tumor of the breast. If there is a suspicion of malignancy the patient should be immediately referred to the surgeon, because it is in the early stages of malignant disease that we are able to accomplish something. Experience has shown that not much can be done by radical surgery in the late stages of cancer.

Charles Farmer: The case reported is especially interesting from the standpoint of the age of the patient. During my service at the Louisville City Hospital we have seen two women under thirty-five years with advanced carcinoma of the cervix which, I believe, is quite unusual. Another remarkable thing about these two women was that neither of them had ever borne a child.

George A. Hendon: Cases of carcinoma of the breast in women at this age present unusual difficulties in diagnosis, on account of the fact that women who are lactating are so very prone to have indurated areas in the breast as a result of mastitis.

This brings to mind one case which I had the opportunity to observe and operate on in a woman about thirty years of age who dated the beginning of the tumor which she had during the time she was nursing her baby about a year before I saw her. On account of that history I was reluctant to make the diagnosis of carcinoma and advised her to wait thirty days longer to see if any change occurred in the tumor. Upon subsequent examination the tumor was found increased in size and radical operation was performed. Pathological examination showed the tumor to be a carcinoma. In about three months

after the operation was performed she began to have evidence of recurrence and was treated with radium. During this time, however, she again became pregnant and aborted at about six months and died during the abortion. There was evidence of extensive involvement of the chain of lymphatic glands inside the thoracic cavity.

In young women tumors of the breast present unusual difficulties in diagnosis, and such tumors are made more dangerous by making diagnostic incisions into these growths or partial removal to have frozen sections made on account of distributing the cancer cells and this disseminating the carcinoma.

I think Dr. Frank is to be congratulated upon his ability to diagnose carcinoma promptly in this young a woman.

L. W. Frank: This case presented practically no difficulty in diagnosis. There was a hard, indurated mass in the breast which involved not only the skin but also the axillary glands. In giving the history of the case the reporter failed to state that this woman's blood showed four-plus Wassermann, but this fact made absolutely no difference in the diagnosis. The tumor looked like cancer, it felt like cancer, the woman had no elevation of temperature or evidence of infection, and we practically excluded everything else but malignant disease. The pathological report subsequently showed the tumor to be an adenocarcinoma.

The unusual feature of the case is the age of the patient. As the reporter has stated, Bloodgood reports one positive case of cancer of the breast in a woman of twenty-one who had observed a lump in her breast only a few months before. In more than eighteen hundred cases the statistics of the Mayo clinic reviewed show two cases of cancer of the breast in women of twenty-three. It was on account of the youth of this patient she was asked to appear before the society, because cancer of the breast at this age is very unusual. Cancer in any situation before the age of thirty is uncommon. We have seen four or five cases of carcinoma of the cervix in patients under thirty years of age, but even in that situation cancer is certainly unusual at that age.

Louis Frank, closing: Ordinarily these cases may present some difficulties in diagnosis at this early age. I think this is probably due to the fact that we have been prone to look upon them as being non-malignant, i.e. we do not anticipate malignancy at such an early age. However, we have seen one other case in the Louisville City Hospital, in a negroess of twenty-five, in which the diagnosis was not made until the patient was on the operating table. She had no glandular involvement, she had nothing involved except the breast, but the entire breast was involved, there

were numerous metastatic or secondary growths in the superficial skin glands. She was subjected to radical operation with wide excision of the breast.

She died of cancer en cuirasse of very rapid growth. Most of these malignancies in young individuals are rapidly growing and they require prompt operation.

Dr. Sherrill mentioned an important point, that is the proper time for operation. Unless patients with breast cancer can be operated upon early little hope for a successful result can be entertained. We have been prone to look upon chronic cystic mastitis, the so-called disease of Reclus, as a benign affection, one in which operation could be delayed without danger. This disease generally occurs on women between twenty and forty years of age. I have come to the conclusion that these patients should be subjected to early operation on account of the tendency to malignant change in these breasts. We know that such breasts are very prone to develop malignant changes. Moreover, in the sections of the breast at a low depth in chronic mastitis it is almost impossible to differentiate the condition from malignancy. I am of the firm conviction that mastitis is a forerunner of malignancy. Bloodgood mentions several cases occurring between twenty and forty which were considered benign and were consequently not subjected to operation. He adds, however, that many of the women could undoubtedly have been saved had radical operation been performed early.

I have come to the conclusion that all cases of chronic mastitis should be treated by excision of the breast, and that radical operation should be performed in the beginning if there is the least question of doubt.

Injury of the Ureter During Gynecologic Operations.—Stajano comments on the difficulty of avoiding injury of the ureter at gynecologic operations as the ureter has no settled position but follows the caprices of the lesions developing in the pelvis. At the superior inlet there is danger of pinching or ligating the ureter in ligating the uretero-ovarian vessels and in suturing the peritoneum. Tumors in and near the broad ligament should be carefully shelled out to leave the peritoneum intact and with it the ureter which may lie in front of the tumor. He warns further that after the uterine artery is severed, it usually retracts; in the search for it, the ureter may be seized by mistake and ligated for the bleeding artery. Still another danger is that the ureter may be included in the spiral suture with the Gersuny technic. This occurred in one case in his experience, the anuria from the mechanical obstacle keeping up for forty-eight hours after the suture had been removed.

AURAL COMPLICATIONS OF ACUTE INFECTIOUS DISEASES.*

By SAMUEL G. DABNEY, Louisville.

Disease of the ear occurs as a complication of scarlet fever, measles, influenza, diphtheria, typhoid fever and mumps.

Scarlet fever presents a larger percentage of aural complications than any other infectious disease (unless perhaps it is influenza)—the proportion being variously estimated at from ten to thirty-three and a third per cent.

In simple scarlet fever the prognosis of aural complications is generally favorable. It is important to note that in all the infectious diseases, as well as independently of them, suppuration of the middle ear may occur with little or no pain. Fever continuing longer than the general disease is likely to produce calls for careful aural examination. The most severe form of suppurative otitis media complicates the so-called scarlatinal-diphtheritic cases.

In measles, mild catarrhal inflammation of the ear is exceedingly common and suppuration with mastoid complications not infrequent. The ear symptoms appearing either at the onset or at the period of desquamation. The destruction of the membrana-tympani is perhaps less rapid in measles than in the scarlet fever variety.

In influenza affecting the respiratory passages suppurative otitis media is exceedingly frequent. It represents three special characteristics: First, we frequently find bullae filled with blood and serum on the membrana-tympani and in the auditory canal. Second, the acute attack is frequently followed by long neuralgic pains with noises and deafness. Third, a large proportion develop mastoid or other complications.

In typhoid fever purulent inflammation of the ear sometimes occurs in the fourth or fifth week. It is apt to be accompanied by extreme deafness from temporary nerve involvement and to be of long duration, but the ultimate prognosis is relatively good. In rare cases total deafness results from panotitis. For the encouragement of my colleagues I would refer to one case of suppuration of the middle ear with suppuration of the parotid gland, occurring in a young girl desperately ill of typhoid. For weeks, so far as I could see, no sound was heard yet the little girl recovered with good hearing, though the suppuration in the parotid affected the facial nerve.

To prevent complications in these diseases

it is recommended to keep the nose and nasopharynx cleansed with some simple cleansing spray; a few drops of a twenty per cent solution of argyrol dropped into the nose and allowed to trickle back into the nasopharynx would probably be beneficial. Early and prompt treatment is important. In mild cases where the drum is not bulging, and where fever is absent or slight, the chief symptom being ear-ache especially at night, five or six drops of a solution of two grs., of carbolic acid, five grs., of muriate of cocaine, and one dram each of glycerine and adrenalin chloride solution put into the ear warm every two or three hours is often of decided benefit. When the symptoms are at all severe, and certainly where there is evidence of bulging of the drum membrane, free incision of the drum membrane should be promptly made. It is much more thorough, and of course far easier to the patient when done under general anesthesia, preferably nitrous-oxide.

The inspection of the drum membranes in infants and in little children is not always easy. It is important to remember that in the more severe cases the inflammation is localized in the attic and the lower part of the drum may appear normal. Perhaps a failure to realize this and a lack of thorough examination accounts for the cases we occasionally hear of in which the drum has been pronounced healthy and rupture has occurred a few hours later. These cases affecting the upper portion of the drum are far more serious because of the structures in this part of the ear which are liable to suppuration and also because of the greater liability to mastoid involvement. It should be remembered that for the first few days of acute suppurative otitis media it is the rule to find considerable fever, marked pain, not only in the ear but around it and decided tenderness to pressure over the mastoid bone. These symptoms need cause no alarm for the first few days. In my opinion it is safe to secure sleep and rest for a day or two at least by a dose of phenacetin and Dovers powder or some similar sedative. It should be emphatically stated that the continuance of such measures beyond the first few days at most is dangerous, as important symptoms might thereby be concealed.

Every patient in the early stages of acute suppuration of the ear should stay in a comfortable room, avoiding exposure and fatigue. If the case is severe, rest in bed is advisable. Every few hours after incision the ear should be irrigated with a teaspoonful of carbolic acid in a pint of normal saline. The canal should then be carefully wiped dry and a little piece of absorbent cotton put into it.

*Read before the Jefferson County Medical Society.

Continued moisture of the canal tends to produce furuncles which have three very undesirable consequences—increased pain, blurring of the view of the drum membrane, and liability to make a mistake in diagnosis of mastoid disease. When the severe symptoms persist after four or five, or at most five or six days, we must immediately consider the possibility of mastoid or other complications. It is well to emphasize the fact that the persistence of symptoms is as important as their severity—barring, of course, symptoms of intracranial disease or sub-periosteal abscess.

Before considering the clinical symptoms of mastoiditis a few words should be said as to the help the laboratory may give in diagnosis. In the order of their value, I would place: First, the x-ray; second, the blood count; third, the bacteriological examination of the secretion, the streptococcus being most often the frequent cause of complications; fourth, spinal puncture valuable in suspected meningitis, and fifth, the bacteriological examination of the blood in suspected venous thrombosis.

Others can doubtless discuss this laboratory side of the question more fully and more positively than I can, but a few words as to my own experience. There has been marked improvement in x-ray pictures of mastoid. I believe it desirable to have an x-ray made in every case of suspected mastoid disease where the clinical symptoms are somewhat doubtful the x-ray picture may readily be the deciding factor in regard to operation. On the other hand, I think that the x-ray and the blood count, even in conjunction with a streptococcus infection, warrant operation in the absence of clinical symptoms.

Illustrating these points I may mention the two following cases: First, a lady of about 38 consulted me several weeks ago with the history that she had been having severe earache and pain back of her ear for eight or ten days; there had been no discharge from the ear.

The drum membrane was bulging in its upper portion and there was slight sagging of the canal wall adjacent. There was decided tenderness on firm pressure just over the mastoid antrum. Her temperature ran about 99 in the morning and about 100 in the evening. Gas was administered in my office and a free incision in the posterior part of the drum membrane prolonged on the superior-posterior canal wall was made. By the following day a free purulent discharge was taking place, but the pain and tenderness still persisted. As these symptoms continued unabated for several days an x-ray picture was made. According to its report the bone was not dis-

eased. Blood count also was favorable. But for this picture I think I should have operated on the mastoid for it is to be noted that the pain and the distinct, though not intense tenderness had now been going on for twelve days—eight days before the drum was open and four days after it was opened. Two or three days later as the pain was still present and the perforation had partly closed, I again made a free incision under gas. No immediate relief from pain, however, took place and the second x-ray examination was advised—this again showed no evidence of mastoid involvement, and fortunately a day or two later, the lady's symptoms became markedly better, and the improvement continued rapidly in the next ten days so that the discharge ceased, the perforation closed, and the lady has returned to her home. In this case there was tenderness well-marked but not intense over the affected antrum (the other antrum being absolutely free from it); there was pain enough to disturb sleep every night for two weeks, and there was rather profuse discharge for about ten days. Such symptoms will usually warrant operation, but it is to be noted that neither the pain nor tenderness was very intense, and the favorable report from the x-ray was the deciding factor in the conservative treatment which turned out well.

Second: To illustrate the necessity for clinical symptoms before deciding on operation I may cite the following case: Several weeks ago I was asked by one of my colleagues to see a boy of eight or ten. Both drums had been discharging for over a week. He was still running a little temperature; there was slight pain, if any; there was no sagging of the upper posterior canal wall; there was no tenderness on any point of the mastoid neither over the antrum nor at the tip nor at the exit of the emissary vein. The clinical symptoms therefore pointed simply to an otitis media, but an x-ray picture showed both mastoids cloudy and the blood count showed a leucocytosis of over 21,000. Both the x-ray and blood count were made by men of recognized ability. In the absence of all clinical symptoms we decided to treat the case expectantly and should the fever and discharge persist many days longer to advise that a freer incision be made in each drum membrane. I am told by the gentleman in attendance on the case that the little boy is doing well and without operation.

This seems to me to illustrate the importance of being guided largely by clinical symptoms, but even in such a case the laboratory report would put us on our guard, watching most carefully the development of new symptoms.

P. S.—I am informed this evening that this boy's ears are still running more profusely than usual, and this running has now been going on for about three weeks. He still has some temperature. I believe that he has some inflamed cervical lymphatics which may account for the temperature, and I think the family physician has been giving some vaccines—I am not sure of this, but if so, perhaps they are producing some reaction. I am told the clinical symptoms of mastoiditis, except the profuse discharge and perhaps the fever, are still lacking; these symptoms after such a time (three weeks) are very significant. Should this little boy after all come to a mastoid operation, it will in my opinion be quite a feather in the cap of our laboratory friends.

Second: The blood count. It seems to me that we need further data as to the importance of leucocytosis or its absence in mastoid disease.

The limits of my paper do not permit extended discussion of the complications. As to the clinical symptoms of mastoid disease, the most frequent complication, I would mention is the first state, that severe symptoms with exceptions above mentioned, need not cause uneasiness for the first five or six days; second, that mild symptoms occurring late or long persisting may be very significant; third, the symptoms indicating mastoid disease under these conditions may be grouped in the order of their importance as, *first*, tenderness of the mastoid on pressure; *second*, pain either in mastoid, deep in ear or radiating over that side of the head; *third*, sagging of the upper posterior canal wall; *fourth*, persistent profuse discharge; *fifth*, fever.

DISCUSSION:

C. T. Wolfe: The second patient mentioned by Dr. Dabney happened to be under my care and further details concerning the history may be of interest. The patient is a boy eight or nine years old who has always been a "hot-house-child"—that is, he has never had the privilege of being much in the fresh air and his physical resistance is rather low. About three weeks ago one morning his mother noticed a stain on the pillow and later found that both ears of the child were discharging. He complained of no pain at that time. Inquiry developed the fact that two years ago he had a slight discharge from one ear which subsided promptly after removal of diseased tonsils and adenoids.

The ear discharge which began three weeks ago soon became very profuse and examination of the pus showed staphylococci as the predominating organisms. Dr. Dabney saw the patient in consultation at the end of a week after a blood count and x-ray examination had been made. The

x-ray showed both mastoid regions very cloudy; blood count, W. B. C., 21,000, polynuclears 84 per cent. It seemed from a laboratory standpoint that the mastoid was undoubtedly infected, but as only a week had then elapsed and the boy lacked some of the clinical symptoms of mastoid disease, we decided to postpone any operative procedure.

Three weeks have now elapsed, the discharge is still profuse, W. B. C., 16,000, polynuclears still 84 per cent, the boy's general condition has improved decidedly, he complains of no pain but the discharge has persisted. A second x-ray examination has not yet been made. The perforations of the drum membranes are low anteriorly and there is no evidence of retained secretions which would be characterized by pain. Every afternoon the temperature ranges between 100 degrees and 101 degrees F., in the morning it is normal. Both anterior and posterior cervical glands are slightly enlarged. Autogenous vaccine has been administered every fourth day by the attending physician; each injection has been followed by a rise in temperature. The profuse discharge has continued, and unless it subsides within the next few days I believe mastoid operation should be performed, especially if the second x-ray examination confirms the findings of the first which was made over two weeks ago.

I. A. Lederman: I wish to emphasize the importance of giving due consideration to acute suppurative otitis media which occurs in scarlet fever, especially the type Dr. Dabney mentioned, i.e., the malignant form. In such cases there is a severe streptococcal infection and within forty-eight to seventy-two hours after inception of the disease extensive suppuration of the middle ear occurs with practically complete destruction of the drum membrane. These are the patients we see years later with chronic suppuration—not of the mastoid, but of the middle ear. It is common for aurists to obtain the history that such cases came from scarlet fever first, and from measles second.

The prevalence of middle ear suppuration during influenza was well exemplified in the two epidemics experienced in Louisville, and during that time each of us saw quite a number of such cases of varying severity. A small number of them, judging from my experience, came to mastoid operation; some presented mastoid symptoms which subsided after incision of the drum membrane.

This subject has been before the society very often, but we cannot too frequently repeat the admonition that early incision of the drum membrane never does harm and in nearly every case it does good. Usually if the drum membrane is incised early enough and incision repeated whenever indicated mastoid abscess can be prevented. We should be prompt about incising the drum

membrane and not wait until all the classical symptoms are present. And I would even go further than Dr. Dabney has in his paper and say that persistent pain and high temperature without bulging calls for incision of the drum. It is important that a free incision be made in all cases.

With reference to the case reported by Dr. Wolfe and also mentioned by Dr. Dabney: In a case of that kind the dangers of chronic middle ear suppuration should be considered. I believe that practically every case of middle ear suppuration persisting more than three weeks profuse in amount regardless of any other symptoms means suppuration in the antrum of the mastoid. Even with the clinical symptoms subsiding in severity, with leucocytosis reduced, with little elevation of temperature, with no pain, I should still be fearful that although surgery may not be required for the immediate relief of this child clinically, still there is great danger of converting the acute middle ear suppuration into chronic suppuration.

Since the first reports of x-ray diagnosis in mastoid disease appeared I have been rather enthusiastic about this procedure. For a time we were disappointed in Louisville because our local men had not perfected their technique so as to give us good x-ray pictures. I saw plates in other cities made by men with much larger experience and their pictures were exceedingly valuable. However, our roentgenologists have now perfected their technique and their pictures are satisfactory.

The x-ray should be used in every case where the clinical symptoms are not complete, but I would not operate on the x-ray findings without any clinical symptoms of mastoid disease. Where the clinical picture is complete we do not need the x-ray; but if the symptoms are not complete the x-ray will complete the picture for us.

Ben L. Bruner: I would like to emphasize the importance of Dr. Dabney's statement that early tympanotomy is indicated in every case of middle ear suppuration. Early incision of the drum membrane does no harm and most cases good is accomplished by this simple procedure. We should not wait for bulging of the membrane before making the incision, and in many cases I believe it is possible by this procedure to prevent mastoid suppuration. In one of the large hospitals with which I was formerly connected we saw quite a number of middle ear suppurations, and I am satisfied we avoided mastoid involvement by early incision of the drum membrane. We did not wait for bulging of the membrane before making the incision and we nearly always found an accumulation of material in the middle ear cavity.

In regard to x-ray pictures of the mastoid: Early in the history of my work in the hospital

to which I have referred we had a man whose plates were unsatisfactory, but later an expert was employed who was of great assistance to us. An x-ray picture properly made by one who understands how to do it is of great value in determining whether there is mastoid involvement and in deciding whether operation is indicated.

In the case reported by Dr. Dabney, as acute suppuration of the middle ear has persisted for three weeks, and particularly in view of the x-ray findings, I think operation should be performed.

A. L. Bass: As to the frequency of acute otitis media as a complication: I was under the impression that it followed measles more frequently than scarlet fever. While I was in Riverside Hospital, New York (contagious diseases) it seemed that we had more middle ear complications with measles than any other disease. Possibly, however, we had more measles than scarlet fever, which made the percentage seem larger. Whenever a patient with contagious disease had a higher temperature than usual for that disease, we investigated the middle ear and in most instances found trouble there; in fact, it was our rule to examine the ears of nearly every patient admitted.

In regard to the diagnostic value of the x-ray: I think it is more valuable after mastoid involvement has persisted for a few weeks. By that time the exudate in the mastoid cells will have changed from a thin serous fluid to thick pus, when the extent of the infection will be better shown by the x-ray.

Relative to treatment: I wish to particularly mention that when a patient has had frequent attacks of acute otitis media due to tonsils and adenoids, where the tonsils and adenoids are not acutely inflamed at the time and should be removed, and the patient then has acute middle ear disease, I perform myringotomy, tonsillectomy and adenoidectomy at the same time. I have recently treated several patients in that way and they all did nicely. In two instances I did a double myringotomy.

J. R. Peabody: I heartily indorse practically everything that has been said by Dr. Dabney in his paper. If permissible I would like to mention one case to illustrate the value of the x-ray in doubtful cases of mastoid disease. This case followed scarlet fever and seems especially apropos in connection with the paper.

The patient was a nurse in the isolation ward of the Louisville Public Hospital which was turned over to my service April 1, 1920. She gave the history of having had scarlet fever four weeks previously with a complicating otitis media which had subsided when I saw her. A few days before being referred to me she began to complain of pain in one ear but had no elevation of temperature. That is a valuable point to remember because many practitioners base the

diagnosis of mastoid disease entirely upon high temperature and tenderness. The patient merely complained of pain, she had a normal temperature, and there was no tenderness over the mastoid region. There were no other symptoms. An x-ray picture was made and after inspecting it I thought the mastoid looked normal and decided to wait. The patient had a slight furunculosis in the canal of the affected side which obscured vision of the drum. This soon subsided and she was allowed to come to my office for further observation.

Based on the clinical symptoms present I practically guaranteed this patient that she would not have mastoiditis. The furunculosis had disappeared and the drum had not perforated but looked red. Ten days later there was noted for the first time some tenderness over the mastoid but she still had no elevation of temperature. This was six weeks after recovery from scarlet fever. While I think we would have been justified in operating without it, another x-ray examination was made and the roentgenologist was certain pus would be found in the mastoid. The patient still had no fever, but little pain, and the leucocyte count was 13,000. Operation showed the entire mastoid necrotic, there was little free pus, but abundant soft granulation tissue, and the sinus was exposed.

This case shows the diagnostic value of the x-ray and also the importance of not relying upon fever and tenderness in making the diagnosis of mastoid disease.

E. L. Pirkey: In every case of middle ear disease the mastoid should be carefully examined. While tenderness will usually be noted early if the mastoid is involved, in some cases x-ray examination will be necessary to settle the question of diagnosis. We should not rely too much on the x-ray, however, because the progress of the infection may be very rapid; that is, at the time the examination is made the mastoid may be perfectly clear, yet a few days later the clinical symptoms may indicate extensive mastoid disease. I have even seen patients with acute otitis media who promptly developed mastoid complications followed by fatal meningitis.

It is important that several x-ray examinations be made where mastoid disease is suspected. The x-ray will show the mastoid cells and also the location of the sinus. In this way it is often of great assistance in determining the extent of the disease prior to operation.

L. L. Solomon: We are oftentimes inclined to discredit the evidence obtained by the x-ray because only one examination is made. If the radiologist could be permitted to see the patient with suspected mastoid disease every few days, and to make repeated examinations as we do clinically, much valuable diagnostic evidence might be obtained. Crile says where the laboratory

does not corroborate the clinical findings, revise the laboratory.

I am glad to see that among diagnostic aids in mastoid disease Dr. Dabney gives first credit to the x-ray and places the blood count, second.

H. J. Phillips: The gentlemen who have thus far discussed this subject are either otologists or surgeons. I would like to speak from the standpoint of the general practitioner.

In the western portion of Louisville, during the last twenty years, I have treated many children. One might infer from the discussion that the diagnosis of mastoiditis is more difficult than that of appendicitis. Every child who develops otitis media is in danger of mastoid abscess, and evidently perforation or incision of the drum membrane prevents mastoid involvement, other wise there would be more cases of mastoid abscess than there are. In my experience mastoid abscess in children is quite rare, much more so than appendicitis.

I have seen many children with discharge from one or both ears, elevation of temperature and tenderness over the mastoid, where the symptoms subsided within a week under expectant treatment. So far as I am aware suppurative disease of the mastoid cells cannot be aborted, i.e., when mastoid abscess has developed it can neither be aborted nor checked, and it is then either an operation to provide drainage or a dead child; yet I have seen many children with fever, tenderness over the mastoid and other characteristic symptoms which subsided without operation. Dr. Peabody's case proves the exception to the rule, which is that fever is the earliest symptom of mastoid disease. In his classification of symptoms Dr. Dabney placed fever last, whereas my experience has been that fever is one of the first indications of suppuration beginning in the tympanic cavity.

We have two mastoids and only one appendix, yet mastoiditis is much more rare than appendicitis and in my opinion less difficult to diagnose.

J. R. Peabody: Dr. Phillips is right in what he has said about mastoiditis in children. The diagnosis is much easier in children than in adults, fever and tenderness over the mastoid being practically always present. In adults all the other clinical signs may be present without fever of tenderness.

S. G. Dabney, closing: I am glad Dr. Phillips discussed this question from the standpoint of the general practitioner and wish to agree in the main with what he has said. I should have stated in my paper that absence of fever in children with mastoiditis is exceedingly uncommon, that it is the rule for such children to have fever, whereas in adults not over fifty per cent show any fever at the time of operation.

We should carefully differentiate between acute

suppurative otitis media and mastoid disease: this is not always done even by antrists. All the symptoms Dr. Phillips mentioned are common in acute suppurative otitis media; and if every child or adult who has fever with tenderness and pain over the mastoid for five or six days is operated upon there will be a tremendous number of successful mastoid operations! In children particularly it is not uncommon to see tenderness, pain and fever which persist for a few days or a week and then disappear, but no one can say these are cases of mastoiditis. As I tried to make clear in my paper mastoid involvement depends upon the persistence of such symptoms. Where the symptoms subside within a week there is probably no mastoid disease.

A young man recently sent to me from the Marine Hospital had a normal pulse and temperature. Four weeks previously he had middle ear suppuration and a few days before I saw him he had a chill but no fever so far as he knows. He had pain over the mastoid region, but this was not sufficient to disturb him very much. He had distinct tenderness on firm pressure over the mastoid antrum four weeks after cessation of his ear discharge. He had no sagging of the upper posterior canal wall, he had a good-sized opening in the posterior part of the drum membrane, but there was no discharge at the time which is exceptional as generally in mastoiditis there is a profuse discharge from the ear. It is believed by certain practitioners that if there is free discharge from the ear mastoiditis will not develop; this is a serious mistake. When profuse purulent discharge from the ear persists for more than two weeks mastoiditis is probable; that is, a profuse persistent discharge is one of the main symptoms of mastoiditis. A feature which makes us doubtful about the diagnosis in the case just mentioned is the absence of discharge; there is a large opening in the drum membrane. I believe the patient has mastoid disease and operation will be necessary. Profuse persistent purulent discharge from the ear, instead of relieving mastoid abscess, is one of the most important symptoms of it.

In the case seen with Dr. Wolfe I believe the boy now has mastoid disease. Of course the inflamed cervical glands and the administration of vaccine may have something to do with the continued elevation of temperature. He probably has a mild staphylococcal infection as the profuse discharge has persisted for three weeks. The x-ray picture is indicative and I am very suspicious of the case after this length of time.

Dr. Solomon has stolen some of my thunder! In two of the cases reported tonight I think mastoid operation was in large measure prevented by the x-ray examinations, and I agree that repeated examinations should be made. Where the clinical picture is complete we do not need

the x-ray, i.e., a chill, high fever, pain, tenderness on pressure over the mastoid region, sagging of the upper posterior canal wall, and continued profuse discharge from the ear, but a complete clinical picture of mastoiditis is the exception rather than the rule.

I agree that it is proper to incise the drum membrane even where there is no bulging if there is pain in the ear; and perhaps it may be wise even when there is no pain if the drum is red and there is persistent fever. It is not always easy to detect bulging of the drum membrane in a child and mistakes are sometimes made.

In Dr. Peabody's case there was undoubtedly a typical mastoiditis following scarlet fever which developed late, and the first x-ray examination was probably correct. Such cases are not uncommon I have seen quite a number of them.

I was much interested in Dr. Pirkey's remark about meningitis developing during the first four or five days of mastoid disease. I doubt whether extension of the infection in such cases is through the mastoid. Cases of that kind are usually seen in children in whom the cranial sutures have not closed, and infection may readily extend through open sutures from the middle ear without a mastoid abscess being present. I recall a young lady whose drum membrane had been opened because of acute otitis media and who developed alarming symptoms of meningitis and died. No evidence of mastoid involvement was found at autopsy; infection had probably extended through the roof of the tympanum to the meninges. This patient was seen only once by me and then in consultation with a gentleman present tonight.

There is quite a divergence of opinion among experienced men concerning the advisability of performing tonsil and adenoid operations during acute otitis media. I have my doubts whether it is wise to add the traumatism of another operation of the existing infection. I believe it would be better to postpone adenoid and tonsil operations until the acute otitis media or mastoiditis had subsided.

Epidemic Encephalitis.—A man of 36 developed in 1916 a disease which has been retrospectively diagnosed as epidemic encephalitis. At the time it was assumed to be typhoid or malaria at first, and finally the man was sent from one service to another as myopathy developed. This seems to be one of the oldest cases yet known of the present epidemic of encephalitis. The acute febrile phase five years ago was followed by extreme muscular atrophy but the condition passed into a stationary phase in two years, and this stationary phase persists to date. It is said to be the first case on record of myopathy of this type after encephalitis.

PNEUMONIA; ITS MANAGEMENT AND TREATMENT*

By C. C. CARROLL, White Mills.

The subject of "Pneumonia" being such a long one, to go into a discussion of all its phases, we will merely attempt to write a few lines on what we consider it's most important phase—especially to the unhappy victim of this, the second largest disease from a standpoint of mortality, to which human flesh is heir—the treatment.

For convenience we will consider our treatment under two heads—Specific and Non-Specific. Ever since diphtheria, tetanus and typhoid fever have been so successfully treated and prevented by the use of specific measures it has been the dream of the medical profession to find some serum or vaccine which place pneumonia in the same class. There are quite a number of investigators working on the serum treatment of pneumonia and all find that this disease is produced by a number of different micro-organisms and each in many respects differing from the other to such an extent it is, or has been, impossible so far to produce a specific vaccine or sera which will have a beneficial effect on cases of pneumonia in general. The pneumococcus is divided into three if not four distinct types which were not recognized by the early investigators and up until the time this differentiation was recognized the mortality in pneumonia treated by the anti-pneumococcic serum was no lower than by the ordinary expectant plan of treatment. Then again, in quite a per cent of cases of pneumonia or cases presenting all the clinical symptoms of pneumococcic infection of the lungs we find may be due to infection produced by other germs, such as the streptococcus, staphylococcus, Friedlanders bacillus, and during our recent influenza epidemic we especially found it due to the infecting agent of this disease. This was so common that many gave the type the name of "flu-monia."

Cole, of the Rockefeller Institute, gives the following plan by which the various types of the pneumococcic may be recognized: A small amount of the sputa coughed up from the lung is injected into the peritoneal cavity of a mouse. After a few hours the peritoneal cavity is washed out with salt solution and this solution is centrifugalized for a short time by which all leucocytes and other cells are removed. To a small portion of this suspension he adds immune sera of types one and two and if agglutination occurs he concludes that

he has an infection corresponding to that particular serum, but if not the bacteria are types three or four. Type three, he claims, may be recognized by the appearance of the peritoneal cavity. The micro-organisms have a longer capsule than the other forms and in animals produced a very stiff mucous exudate.

Now under class four he seems to put all other organisms claimed to produce pneumonia and for which there seems to be no plan for recognition, except by the ordinary microscopic examination of the sputa and excretions of the lung. He claims that types one and two produce in animals a protective serum, while types three and four do not. The immune serum for one and two may be produced from the horse just as other serums are produced. Type one has great strength, and type two less potency. He further concludes that the reason that the sera heretofore has been unsatisfactory, as a curative agent, is because the sera has not been produced with a knowledge that these various types of pneumococci produce sera which are curative only against germs of their own type.

After making observations on 432 cases of pneumonia at the Rockefeller Hospital and the Pennsylvania Hospital in Philadelphia, it was discovered that one-third of the cases were due to infection of type one, one-third to infection of type two and one-third to infections of type three and four. The mortality in type one not treated by serum was about twenty-five per cent, type two, twenty-nine per cent, type three, forty-five per cent and type four, twelve per cent.

Out of seventy-two cases type one treated with serum only six deaths occurred, or a mortality of about eight per cent, which is a strict gain over twenty-five per cent untreated.

The method of treatment used was as follows: As soon as the patient was brought to the hospital he was given $\frac{1}{2}$ C.C., or 8 M., in order to test his sensitiveness and to desensitize him if possible. When the type of bacteria is discovered he is given 80 C.C., or 2.6 oz., by intravenous injection, this is repeated every twelve hours until the temperature and pulse rate fall. There is usually more or less reaction after these injections but none have proved serious so far. It is also claimed that in case we have pneumonia due to the streptococcus hemolyticus infection the use of appropriate antistreptococcus serum gives good results. A few years ago it was claimed quinine and one or two other of the cinchona derivatives possessed more or less bactericidal action against the pneumococcus infections but this idea seems to have been abandoned. Concluding, as to specific treatment

*Read before the Muldraugh Hill Medical Society.

of pneumonia, we will say that so far all plans seem impractical except in a well-equipped hospital but it is to be hoped that some day a serum will be found that will be to pneumonia what the present anti-toxin or serum is to diphtheria.

Non-Specific treatment: There is no limit to what might be said about the expectant plan so called of the treatment of pneumonia and not desiring to take unnecessary time or to be too hard on your good nature and patience we will merely touch this subject on what we consider the most essential features. A few of the most essentials might be mentioned as follows: first, an early diagnosis, second, rest in bed, third, an abundance of fresh air, fourth, proper nourishment, fifth, constant watching of the patient, sixth, the use of proper drugs at the proper time and seventh, careful attention to the complications and all symptoms calling for special treatment as they arrive.

By rest we mean both mental and physical absolutely. Early in the disease our patient may seem to have an abundance of strength and it might seem foolish to ask him not to arise for urination, defecation, etc., since no patient as a rule likes the use of a bed-pan at first but energy unnecessarily wasted at this time might mean death later on. But few persons should be allowed in the room. How often have we seen patients after having attempted to notice or perhaps converse with visitors, show signs of restlessness and symptoms of bad omen later on even though at the time of the visit he may have appeared bright and doing well? Occasionally a patient may fret to see some member of the family or some friend and it becomes necessary to admit them but as a rule visitors are not a good remedy for a pneumonia patient. Rest should continue for at least a week or ten days after convalescence has begun. Most writers claim a patient should not even be propped up until the fever has been normal for ten days.

This brings us to consideration of what we consider the most essential measure that has ever been advocated in the treatment of pneumonia—fresh air. What would some of those grand old practitioners of early days say if they could behold a pneumonia patient on the housetop or an open porch in the dead of winter? We do not believe, gentlemen, that there has been a hygienic or therapeutic measure brought into the practice of medicine that has saved more lives with the exception, perhaps of diphtheria antitoxin and typhoid vaccination than the so-called open air or fresh air treatment of this most dreaded disease. The direction of the older writers to keep the room

of a pneumonia patient from 60 to 75 degrees F. was certainly not the best. It makes no difference what the temperature of the room is, in fact our patient seems to do better if it is the same as the outside air, and except for the comfort of the attendants little does it matter if the patient is well protected with bed clothes, hot water bottles, etc. But by all means let the cool, fresh, unheated unbreathed air to his lungs. We have seen a restless, delirious, cyanotic patient drop into a quiet peaceful sleep by merely opening the window and letting the wind blow in his face. As a matter of fact in very cold weather our patient should be well wrapped and his body protected from the cold. In case his clothing needs changing and you have him in an open room or on the porch it is best to roll him into a warm room and don't be surprised if he ask you to hurry up and get him into the fresh air again. Experience has proved that it is not so much the cool air or cool temperature of the surroundings that gives a patient comfort as it is the free circulation of pure, sweet, fresh air. This rule holds good it makes no difference whether it be dry or rainy and wet weather. Protect your patient from the storm and draft, if it be too severe, with screens but by all means let him have pure air. We may be a little over enthusiastic about fresh air treatment, but, gentlemen, if you will try it you will never abandon it, but you may have some trouble with the patient's friends.

The food of a pneumonia patient should be nourishing and not given in very large quantities. As a usual thing milk, sweet or sour, and soups or broths answer best. Watch out that no food ferments in the intestine for abdominal distention, while not always due to food, is a very troublesome and painful condition. Should this occur reduce the food to a minimum. Keep the bowels open but do not purge too freely lest you weaken your patient.

A skillful attendant, or best, a trained nurse, should be constantly at hand; delirium or rapidly occurring heart failure might not be noticed by an untrained nurse. If possible it would be best for the attending physician to see a pneumonia patient twice a day or at least have a report from a skilled nurse during the day and night or as often as the severity of the case demands.

The fever unless it be above 103 or 104 degrees F., as a rule calls for no special treatment and in fact a fever of this height seems as normal to the disease as the rusty sputa. However, should the fever become very high, cold in some form applied to the head and to the affected side seems to ans-

wer very well. Cold tar derivatives should be very carefully used, if used at all as they are too depressing. Some advocate cold baths and cold wet packs, but it seems to me these are too harsh. We have never had to resort to such measures.

Delirium some times gives us a lot of trouble, in fact, all cases have it more or less. Formerly, this was thought to be the result of the fever but it is now generally agreed that it is of toxic origin. Plenty of fresh air and lots of water seems to answer for this symptom. Bromides or bromides and chloral, if the heart is well fortified against the depressant effect of the chloral, are also excellent remedies. Finally, if no other means answers morphine or some form of opium may be used but use it in as small doses as meet the requirement, for it is not best to narcotize your patients. Circulatory disturbances may be brought about in several ways. They may be due to severe toxemia or an over amount of toxin circulating in the blood. In this condition we usually find a rapid, feeble pulse with a low blood pressure except just before death when the pressure will rise. Circulatory disturbances from extensive infiltration of lung tissue is usually manifested by marked cyanosis and a high blood pressure. In the third condition we find a decided cyanosis, a leaky skin, patient bathed in perspiration and running feeble pulse or in other words a typical shock. For the first condition fresh air, cold sponges, if fever is high, which it usually is, more water, or better still, normal saline solution by some method, proctoclysis is usually best borne by the patient, also caffeine and strychnine are valuable remedies. Some advocate digitalis for this condition. In the second condition, some advocate bleeding and the bolder use of such heart stimulants as caffeine, ammonia, digitalis, etc. We have never yet bled a patient with pneumonia and can't say whether this plan of reducing the blood pressure and the other symptoms such as embarrassed right heart, etc., works well or not. The third condition or condition of shock is practically hopeless. Bolder stimulation with such drugs in addition to these already named, as strophanthus, atropine, and adrenalin may be tried but is usually of no avail.

Toxemia indicated by low muttering, etc., call for fresh air and more fluids. Open the windows more, regardless of the outside temperature. Give the patient water any way and every way that you can. Many use (if they can get it) small doses of alcohol in the form of whiskey or brandy. Say one-half ounce every three or four hours. Larger doses if the patient has been in the habit of

using alcohol as a beverage. Abdominal distention is usually benefited by remedies for the toxemia and a more limited diet. Although a rectal tube, a turpentine stupe, hot to the abdomen, pituitrin, etc., may be needed.

Some authors claim that acute dilation of the stomach frequently occurs in pneumonia for which gastric lavage is recommended. Most all cases have more or less nephritis for which an abundance of fluids and a milk diet together with a warm poultice of some sort over the loins is the remedy.

It is rare that we have a case of lobar pneumonia without some pleurisy. Strapping the chest, cold in the form of an ice bag to the affected side, some form of opium if the pain is too severe, but be careful in using opiates, are the remedies usually given. Some times we have an effusion to deal with and if it does not embarrass our patient we may safely wait until the pneumonia runs its course but in case it does produce respiratory troubles, by the use of a local anesthetic it can be aspirated without any bad results. In case this fluid becomes purulent, of course it has to be evacuated or partly drained, until our patient can stand a complete operation.

The most commonly used drugs in pneumonia are digitalis, strychnine, morphine, caffeine, camphor, nitroglycerine, calomel, etc.

There is much difference of opinion in regard to digitalis. We have often seen it derange the stomach. If you use it, be sure that it is good, for a bad article is worse than none.

Strychnine is, to my mind, the most important drug of all. Now, after years of esteem and satisfaction with the use of this drug along comes the Pharmacologist and says that it is not a heart stimulant at all. Well, maybe he is right, but we advise the use of it in doses from one-thirtieth to one-fifteenth gr. every three or four hours, to all cases of pneumonia throughout the disease and well into convalescence.

As we have already said, use morphine with care. But it is a very good remedy when nothing else will control the delirium.

Atropine should be used in doses of one one-hundredth of a gr., or more if edema of lungs threatens.

Caffeine is a very good stimulant but we have not used it much.

Camphor, or better camphorated oil used hypodermically in one to three or five gr., doses we have seen give some excellent results as a stimulant, especially near the crisis.

Nitroglycerine is said to be an excellent remedy in a laboring right heart with a high

blood pressure. It dilates the peripheral vessels thereby producing a better pulse.

Calomel is an excellent remedy in abdominal distension and should be used as a laxative or purgative as indicated. To this list might also be added quinine, strophanthus, etc.

Most all patients seem to do best with an expectorant mixture. Personally, we like the old-fashioned muriate, or muriate and carbonate of ammonia mixture, but the stimulating expectorants are not used nowadays so much as some years back.

In conclusion, we will say that we believe many cases of pneumonia are over-treated so far as medicine is concerned and we believe if we would bear more in mind that we can do but little for pneumonia but much for a patient with pneumonia and treat the patient and let the disease run its course we might have fewer deaths. As we have already said we do not wish to tire you out for we don't feel like we have said or brought out a single new thought but we hope to at least bring out something in the discussion worth while, so thank you very, very, much for your kind attention, we will close.

MEDICAL FADS AND FRAUDS*

By A. H. BARKLEY, Lexington.

If physic be a trade, it is the trade of all others, the most exactly cut out for the charlatan. There is the absence of all restraint and the only security for the doctor's ability and fair dealings is often what is wafted to the public in the gossip-tale of some retainer in his interest.

The term "quack" may be applied to every practitioner who, by pompous pretenses, mean insinuations, and indirect promises, endeavors to obtain that confidence to which neither education, merit nor experience entitles him.

There has always existed in the human mind an innate love of the mysterious, and mankind has, ever since the creation of the world, delighted in deception, thinking, with the poet, that "Where ignorance is bliss, 'tis folly to be wise."

A visit to a quack must produce a pleasurable excitement. There is something piquant in the disdain for prudence with which one delivers himself up to that illegitimate sportsman of human lives, who kills us without a qualification. There is a delicious titillation in a large demand upon our credulity; we like to expect miracles in our own

proper person, and the layman will go to the illiterate practitioner of medicine for the same reasons which induced our poor ancestors to go to wizards.

How true it is that—

"First man creates, and then he fears
the elf,

Thus others cheat him not, but he
himself.

He loathes the substance, and he loves
the show,

You'll ne'er convince a fool, him-
self is so,

He hates realities and hugs the cheat,
And still the only Pleasure's the
deceit."

That the spirit of commercialism dominates the age cannot be denied, and that its effect on every profession and upon people in all walks of life is a matter of daily observation; the preachers accuse each other of following the Lord for the loaves and fishes; the lawyers charge each other with receiving fees from both sides, and the best doctors charge that commercialism is the bane of the medical profession. Thus, we find scores and hundreds of young men studying medicine because they have heard of the large sums of money some of our professional brethren in large cities are making, thinking they too will get some of the "easy money." Then we have the stock company medical colleges, which are nothing more than diploma mills. These latter, thank God, are becoming less numerous and will eventually cease to exist. The so-called Medical Journal Stock Company, in which many physicians are induced to take a block of stock, with promise of large returns, are run by a few shrewd charlatans whose only object is to fleece the investors and disperse as little knowledge as possible.

Social conditions are at present responsible for no small amount of graft and quackery as people judge a doctor by the appearance he makes, and to be somebody one must keep up appearances for the sake of maintaining his social standing in his particular community. Even if the people know you are going mainly on pretensions they will wink the other eye and accord to you a place in their midst that your pomp and pretensions claim. Most of the world are slow to engage in mud slinging, as they are fully aware of the material of which their own homes are constructed.

Why do quacks flourish? It has been said that a fool is born every minute, but this is not a satisfactory explanation, for the majority of people are nowadays fairly well educated. One of the principal reasons is that

*Read before the Kentucky Valley Medical Society, Winchester.

they are either too highly educated or not educated in the proper way, inasmuch as the average man or woman may know something about law, theology, and the current topics of the day; but when it comes to their knowing anything about the laws of health and how to care for their bodies they are densely ignorant.

We find the highly educated man patronizing the quack doctor, the Christian Science healer, the faith cure, the man who cures by magic, etc. It is because he has not enough of the right kind of knowledge. If he only knew that many of his ills were imaginary or psychical, and that he would get well, he, in all probability, would not consult them. While it is true that for a certain class of psychical patients Christian Science may be of benefit, yet it can not be too strongly denied that organic conditions can be treated and cured by any of the above named methods.

When we disclaim against the iniquity of quacks, we should at the same time laugh to death the folly of those who seek them. They are the cause, to a very large degree, of quackery. They are as much answerable for the spreading of vice as the mother is, who feeds her favorite child stolen sweets and wails over the misdeeds at the gallows. The followers of quacks and fads in medicine are the cause of quackery and fadism; they are the cause of many of the atrocious homicides that have been committed. One simpleton bears testimony to the virtue of a particular quack or a certain fad, and another to his mysterious air, and still another to his wonderful cures. Nothing was ever so sudden, so certain, or so marvelous as was the cure of Mrs. X after her case was pronounced hopeless by the best physicians, notwithstanding the fact that she had never consulted a real doctor. His wonderful wonders, as Mathews justly called them, are the theme of the tea-table and the gossip of the nursery.

The witnesses are not to be withstood. One blows his penny-trumpet, another winds his horn, and a third cackles, a fourth brays, and the end is—what? Why, that another victim is added to the list, and the fame of the brute-deity extended. The proselytes of an idiot of this sort are its basest flatterers, but it must be owned, they are also efficient friends. They stick at nothing for his sake, having themselves taken his merits upon trust; they insist upon propagating them after the same fashion. They assure their friends that "the universal Antinorbous drops," have cured twenty thousand people in one year, all of them having been given up by doctors of the highest repute. A person laboring under an affection of the heart or lungs is in-

duced by some puffing advertisement to try the wonderful efficacy of a particular pill. He does so, and finds himself no better; "per-severe," so reads the instruction—you can not expect results until all the "humors" have been driven out of the body by the pills. The patient acts upon such advice and swallows them by the tens and twenties at a time, until he finds himself advancing, as the Irishman said, backward; and it is not until the disease has obtained a firm grasp on his constitution that he discovers that he has been trifling with his very existence. Application is then made to the physician and a degree of astonishment is expressed when the patient is told that his disease is of a serious, perhaps fatal nature. Whom is he to blame but himself? He placed his life in the hands of a man totally ignorant of the first principles of medicine and swallows his nostrums, and then wonders at the result.

Why do medical fads and frauds get such a hold on the people? The answer is not hard to find, if we stop to reflect upon the fact that the practitioners of these fads and frauds get their cures by the same method and upon the same principles as did the doctor of the old school, i.e., faith cure—the psychic effect of the thing done, it matters not whether it be the giving of a little sweetened water—a dose of calomel—a Christian Science pow-pow—the laying on of hands, or the removal of a growth by an osteopath or the adjustment of the spine by a chiropractor.

The principles of mind or faith cure are legitimately used by the honest doctor, as suggestive therapeutics or psycho-therapy has been and is continuing to be studied by those who want to use it honestly and intelligently. The honest doctor realizes fully that abuse of this principle figures largely in the maintenance of the shyster—and it is the very foundation of all new schools and healing fads. This the people must be made to understand, or fads and frauds will continue to flourish. Much has been done already along the line towards enlightening the public, as the vast majority of the people are now much better informed than formerly. The woman's clubs, social settlement organizations, the district nurse, boards of health, properly prepared articles for the daily press, public lectures, and in many other ways, and it is through such channels that the public should receive the information they need, as on these methods the best medical organizations and the best medical men have placed their stamp of approval. The time has passed when we can wrap ourselves in a cloak of professional dignity and assume an air of infallibility toward the public. Such sentiment would go

far toward clarifying the layman's mind and remove the many mystifying things that surround medicine and medical men, and would soon change the attitude of the laity toward the profession from one of suspicion to one of respect.

People apply to quacks in many instances for two reasons: first, because health is offered to them at a cheap rate; and second, like drowning men, when honest doctors give no hope, they catch at every twig. Thus, the love of life on the one hand and the love of gain on the other, create a tolerably good correspondence between the quack and the public.

The desire of health and ease, like that of money, seems to put all understandings on a level. The avaricious are duped by every bubble, the lame and unhealthy by every quack. Each party resigns his understanding, swallows greedily, and for a time believes implicitly the most groundless, ill-founded and delusory promises; and nothing but loss or disappointment ever produces conviction.

That quacks sometimes succeed when the honest doctors fail is undoubtedly true. An honest practitioner will not hold out to a patient, sinking under the influence of a mortal malady, delusive hopes of recovery; but the unprincipled charlatan says: "I can cure you; your disease is not fatal, only have faith in me and I will put your ills to flight." Lord Bacon says: "That the imposter frequently triumphs at the bedside of the sick when true merit is affronted and dishonored, the people have always considered a quack or an old woman as rivals of true physicians." Hence, it is that every physician who has not greatness or soul enough not to forget himself, feels no difficulty in saying with Solomon, "If it is with me as with the madman, why should I wish to appear wiser than he is?" And as Butler aptly says:

"The world is generally averse

To all the truths it sees and hears,

But swallows nonsense and a lie

With greediness and gluttony."

It is a singular thing in history that neither thought, study, apprenticeship nor preparation or any sort is necessary to accomplish the perfect quack. He springs out at once from obscurity and ignorance, completely consummate. Like Pallas, when she jumped all armed from the brains of Jove, so is the quack. He is eased all over in native brass from top to toe, armed in scales like the serpent and like him, he is not wanting in fangs. Other pursuits require time, patience, reading and long practice before the profession is allowed to be practiced; but the quack has none

—he is utterly ignorant, in the vast majority of cases, of simples; the nature of the commonest herbs is unknown to him. And likewise is he ignorant of the alphabet of medicine. Yet he thrives and runs laughing through and at the world.

Every age has its peculiar delusion. It was Voltaire who said, alluding to the election for members of parliament, that "Englishmen went mad every seven years." Had he lived in the present day and witnessed the infatuation exhibited for every startling medical humbug, he would, doubtless, have felt disposed to think that a certain portion of the people had annual fits of mental derangement.

DILATATION OF THE HEART.*

By J. F. DUNN, Arlington,

This being a very lengthy subject, I shall make my remarks as brief as possible in order not to consume too much of your valuable time.

By dilatation of the heart we mean the abnormal increase in the size of any or all of the cavities of the heart. The walls of the heart may be thicker, thinner, or of normal thickness, giving rise to the terms respectively known as, first, hypertrophic dilatation; second, atrophic dilatation, and third, dilatation with little or no variation in the thickness of the walls.

The hypertrophic form is always chronic and in fact most all forms are chronic. The continued stretching of the cavity causes undue strain on the wall of the cavity and nature comes to the relief and gradually thickens the wall in order that it may be able to perform its function, although it may be in a limited way.

In the atrophic form the walls of the cavity are thinned, in which case the capacity of the chamber may be only slightly increased or it may be suddenly increased to such an extent that the thinned wall can scarcely hold the great amount of blood therein.

Dilatation of the heart is often secondary to valve lesions. More than one cavity is usually affected and sometimes all of them to some extent.

The auricles are more frequently distended than the ventricles, and the right ventricle more often than the left. So it seems that the left ventricle is less often damaged than any of the heart chambers.

The shape of the heart is of course changed and this depends upon the extent and location of the part affected. When the ventricles

*Read before the Carlisle County Medical Society.

are enlarged the apex is broadened and when all of the chambers are affected the heart assumes the shape of a sphere.

ETIOLOGY

There are, according to Anders, two causes of cardiac dilatation, viz., first, increased endocardial tension; second, diminished resistance.

1. Among the many things that cause increased endocardial tension are obstruction to the circulation as in arteriosclerosis, chronic interstitial nephritis, atheroma, and congenital narrowness of the aorta. Of course when the blood channels through which the blood has to be forced by the heart are narrowed and the heart is compelled to force the usual amount of blood through much smaller spaces and in the same length of time it can be clearly seen that this great pump, the heart, is in grave danger. Nature has so wonderfully arranged it that the heart under normal conditions can expel its contents, the blood, which makes its tour through the arteries, capillaries, and veins without the least bit of exertion on the part of the heart. But when a considerable part of the vascular system is obstructed it requires an extraordinary amount of force on the part of the heart to be able to perform its task, the result being that the walls of the heart stretch and you have a dilated condition of the part involved.

Valvular lesions are a common cause of dilatation, for instance, in mitral regurgitation a certain amount of blood during systole is regurgitated back up into the auricle and this oversupply of blood in the auricle causes it to be distended, and while in this high state of tension it forces its contents down into the ventricle, thereby causing it to be put into a high state of tension. So it is this continued stretching of these chambers that cause their chronic dilatation.

Another thing which causes increased tension on the heart is habitual severe physical exertion as in the case of athletes and men who follow laborious occupations. Sudden dilatation may sometimes come on during a single violent or prolonged muscular effort as in climbing a mountain, excessive bicycle riding, etc.

2. Diminished resistance is produced in anything that tends to weaken the cardiac wall. There are many factors which have a tendency to do this, such as rheumatic endocarditis and pericarditis, acute infections, fevers, fatty degeneration, exophthalmic goitre, tachycardia, excesses in tobacco and venery, leukemia, and chlorosis. These conditions as we have just stated weaken the resisting power of the heart and if while in this weakened condition, the test comes it is not

able to bear the burden and dilatation takes place.

SYMPTOMS

About the first symptom the patient notices is shortness of breath upon exertion. This symptom gradually increases until it is constant and the patient can scarcely talk on account of his hurried respirations. In his own words, he is "out of breath" all the time. This continues from bad to worse and finally the patient has to sit up day and night in order to breathe.

The heart palpitates and there is a sense of oppression in the cardiac region. In the mild cases there is pallor, but in the severe cases there is cyanosis, with cold extremities. Oedema develops and sometimes there is ascites and hydrothorax.

Physical findings:

Upon palpation we find that the heart beat is not strong as in a normal heart, but feeble and, as one author expresses it, it resembles a quick tapping or slapping of the chest wall.

By percussion we can determine the area of enlargement. In a normal heart the area of dullness of course extends over the entire area of the heart, consequently, if the heart becomes larger than normal the area of dullness will also extend over a larger space. Therefore, if we understand fully the boundary lines of a normal heart we certainly will have no trouble in outlining an abnormal one. The only trouble is to be able to determine definitely what part of the heart is affected.

I shall not take up your time in discussing the various ways of auscultating and percussing these dilated heart conditions as you can readily turn to them in any text book if your memory needs refreshing.

PROGNOSIS

As each case of dilatation stands on its own merits and as it bears the same relation to the heart that jaundice does to the liver, it behooves us to be very careful in assigning a patient to his reward.

The cause must be taken into consideration as well as the occupation of the patient and the after treatment.

In case of sudden dilatation due to severe exertion it is said that they completely recover. But in the chronic cases complete recovery seldom if ever takes place, but the patient may make a wonderful improvement and be able to perform light duties afterward.

TREATMENT

We should strive to prevent this trouble when possible. This can only be done by early recognition and treatment of the disease which ultimately leads up to dilatation.

For instance, all high blood pressures should at once be corrected if possible. As we said in the beginning all conditions which narrow the lumen of the vascular system are liable to produce dilatation, therefore, it is necessary that we release this vascular tension at the earliest moment.

In treating this condition (cardiac dilatation) we should insist on absolute rest in bed. But in case the patient is unable to lie down he may be permitted to sit up with a rest in front of him. It is very necessary to avoid all forms of exertion in order that the heart may be relieved of any unnecessary effort.

The diet should be very light and nutritious, consisting of milk, eggs, fowl, beef juice, and gruels, but some of these may be contraindicated when the underlying cause is taken into consideration.

The bowels should be moved regularly and flatulence should be prevented as any abdominal distension causes some effort on the heart.

The best cardiac stimulant in these cases is digitalis. This should be pushed to full physiological effect. Strychnine, caffeine, and strophanthus are also valuable.

The patient should not be allowed to get out of bed too soon when convalescing and when he recovers sufficiently to go about, his occupation should be sedentary thereafter.

A FULL TIME PREGNANCY WITH AN IMPERFORATE HYMEN*

By H. A. DAVIDSON, Louisville.

On July 3, 1920, Mrs. W. S. R., Lyndon, Ky., was referred to me by her attending physician for diagnosis and treatment. She gave the following history. She was 29 years of age, was married October 11, 1919, menstruated last on September 27, 1919, was not very sick during the early months of pregnancy, felt life in March, 1920, and thinking she was well and normal in every way did not present herself for examination to her physician until near the time for labor. Her physician attempted to examine her but could find no opening into the vagina and after several attempts referred her to me. Inquiring into her early menstrual history, we found that at the age of 14 for about six consecutive months she complained of pelvic pains without any menstrual flow, the pain grew worse and a swelling appeared. A country physician was called and after examination he cut with scissors an opening through the hymen and liberated a very large amount of

blood which was evidently under great pressure because it bespattered the doctor's clothing. She was ill for a few days and then resumed her normal duties. From that time she menstruated regularly every 28 days, menses lasting six days, painful the first day. After marriage she complained of pain on intercourse and while her husband wanted her to consult a physician, false modesty prevented her from doing so.

Upon examining her I found an imperforate hymen, rather thick but easily stretched like rubber. A rectal examination revealed the vagina, cervix and uterus apparently normal. Pelvic examination proved the external pelvic measurements ample in size. The fetal heart sound was normal. The physical condition of the patient was found to be excellent.

If her dates were correct she was due to be delivered July 4 or 5. Arrangements were made for her to enter the Norton Infirmary July 5, or earlier if labor pains should start. The next morning, July 6, with gas ether anesthesia, a circular excision of the hymen was made. Interrupted sutures of chronic catgut were placed all around the vaginal orifice. Examination of the vagina showed an absence of the rugæ which are nearly always present in nulliparous women, the vaginal membrane being perfectly smooth. The cervix was soft and partly dilated, the breech was presenting. The patient was on the table only a few minutes, the amount of anesthesia being reduced to a minimum, because of danger to the child. The excised hymen was about one-thirty-second of an inch in thickness, there was no apparent opening, but upon stretching a pin-hole opening was perceived. During pregnancy, when the menstrual flow had ceased the small opening which had been made by the scissors had contracted until there was no apparent opening. The patient had no post-operative vomiting and suffered very little inconvenience.

At 2 A. M., July 7, 1920, about eighteen hours after the operation her first pains commenced. Labor progressed rapidly, the membranes ruptured at 7:45 A. M. A normal male child, weight 7 pounds, 11 oz., was born at 9:10, the placenta delivered at 9:16 A. M. The presentation was vertex, the position left occipito-anterior. The interrupted sutures around the vaginal orifice allowed a normal dilatation of the soft parts and there was no laceration. The puerperium was normal in every way.

An imperforate hymen may be congenital or acquired. The acquired forms are the result usually of an inflammatory disease like diphtheria, measles or gonorrhea. Occasional-

*Read before the Jefferson County Medical Society.

ly this is the result of traumatism or irritation due to the presence of pin worms in infants. The tubes, uterine and vagina are formed in the early weeks of fetal life from the müllerian ducts. In rare cases the lower end of the müllerian ducts after they have fused remains closed and forms an imperforate hymen which constitutes the congenital variety.

Such cases as the above are very rare in obstetrics and should be reported when observed.

DISCUSSION:

Edward Speidel: The fact that the patient referred to by Dr. Davidson conceived shows conclusively that the hymen was not imperforate. The head of the spermatozoon is about the size of an erythrocyte and the hymen must have a slight perforation which during coitus was made sufficiently large to admit at least one spermatozoon, the only factor necessary for impregnation. This spermatozoon after entering the vagina proceeded on its way unaided as it had the power of motion, and thus impregnation ensued.

I have never encountered a case exactly like the one reported, but recall one of imperforate hymen congenital in type in a girl of eighteen who came to me in an emergency being unable to micturate. Upon attempting to introduce a catheter a decided bulging at the vaginal orifice was noted, and rectal examination disclosed the condition which was suspected, i.e., a large hematocolpos behind an imperforate hymen. This girl had been treated by another physician three months or more for amenorrhea by the administration of tonics, etc. No local examination had been made as she was a virgin and the imperforate hymen was not discovered until she came to me. A crucial incision was made which liberated about a quart of black-looking blood. The vagina was greatly distended and the cervix pushed upward by the accumulated blood so that dressing forceps introduced the full length barely reached the cervix. By digital examination the cervix could not be touched.

A. R. Bizot: Several years ago I saw a patient with a condition simulating the one Dr. Davidson has described. The woman was about six months pregnant and complained of discomfort about the vagina and anus. I undertook to make a digital examination but could find no opening in the hymen. I remarked to the patient that she evidently had an imperforate hymen, and I did not understand how she could have become pregnant. No treatment was instituted.

The same evening the woman's husband came to see me, and insisted upon knowing why I thought his wife could not become pregnant. I

explained that examination had revealed no opening in the hymen, and I told him what the hymen was. He gave me to understand "that he had done his duty and if the hymen was not ruptured it was none of my business."

The woman was delivered at term by another physician without operation or any difficulty arising.

H. A. Davidson, closing: In the case reported when the hymen was examined in its normal position it was imperforate, but when stretched upward with the finger toward the cervix there was perceived a pin-hole opening as Dr. Speidel has stated, which, of course, allowed ascent of the spermatozoon. When the hymen was in its normal condition, i.e., retracted, it was absolutely imperforate.

Dr. Speidel mentioned in reporting his case of congenital imperforate hymen with hematocolpos that a crucial incision was made. I am aware that has been the customary operation for imperforate hymen, but crucial incisions in the hymen nearly always close just as happened in the case I have reported. The better plan is to perform complete circular excision of the hymen thus providing adequate drainage and preventing future closure of the opening. That was the procedure followed in the case reported.

The patient was in my office a few days ago. She now has a perfectly normal vaginal orifice.

DIAGNOSIS OF PATHOLOGICAL CONDITIONS OF THE GALL BLADDER*

FRANK P. STRICKLER, JR., Louisville.

This is a very broad subject and one could write a lengthy paper upon it, but I shall attempt to mention only the most common pathological conditions of the gall bladder and in doing so we shall more or less have to deal with the liver, bile ducts and associated organs due to their intimate anatomical relation.

First, let us consider the medical and surgical history of the subject. No data is given in the writings of antiquity that would allow us to infer with certainty that the physicians of that time were informed upon the subject of gall bladder pathology.

The first mention of symptoms which could be attributed to the gall bladder, we find were made by Hippocrates and Galen, at this period discovery of stones in the stools was mentioned, but at this time and up to the reign of Alexander the Great, dissection of human bodies was not permitted, due to various religious and superstitious beliefs. It was impossible for the ancient physicians to have any definite knowledge upon the subject.

*Read at December meeting Muldraugh Hill Medical Society, Elizabethtown.

Gentilis, of Foligno, in the fourteenth century first found stones in the gall bladder of a corpse he was embalming. From this time on, more or less attention was attracted to the gall bladder and associated anatomical structures. Fernellius in 1554 gives a very good description of gall bladder conditions, describing stones, occlusion of the common duct, swelling of the gall bladder and advanced the theory that stones were formed from bile which had remained too long in the gall bladder.

At this time many interesting and absurd theories were advanced on the formation of bile and stones.

Glisson, in 1654, was a contributor to this subject both on anatomical and clinical lines. He describes an attack of hepatic colic which he, himself, experienced that is typical of our present day descriptions. At this same time Stalport Van der Wiell describes the evacuation of an abscess which contained stones.

Etmuller gives a still more lucid description of gall bladder pathology, physiology and surgery, he first mentions the experiment of extirpation of the gall bladder of a dog, without observing any bad results to the animal. It is of interest to note that he concludes his article with the statement that there is no cure for gall stones either medical or surgical.

Gottfreid Muller, in 1742, observed a perforating abscess of the gall bladder that burrowed through the stomach and abdominal wall, the external opening was enlarged and a stone extracted leaving a fistula which discharged bile and chyme. One year later J. Petit called attention to this form of suppuration of the gall bladder and emphasized the necessity of draining these cases. He only operated, however, in cases where adhesions between the gall bladder and parietal peritoneum were present as shown by immobility of the gall bladder and inflammation of the skin.

Herlin and L'Anglas studied the ligation of the cystic duct incision and extirpation of the gall bladder as early as 1767.

In the eighteenth century many interesting contributions to this subject were made by Portal, Meckel von Hemsbach, Andral. During this period, thanks to the discovery of bacteriology we possess a clearer picture of pathology of the gall bladder.

Further advances were made upon this subject by Kocher, Marion, Sims, Kuster, Courvoisier, Lawson Tait, Reidel and others. The experience that these surgeons gleaned has thrown a great deal of light on the general picture of gall bladder pathology, not to mention the information which has been added

by the prominent surgeons and medical men of today.

Probably one of the most common of gall bladder conditions we deal with at the present time is cholecystitis either with or without stones. The causative factor in this case is usually due to a bacterial invasion of the gall bladder from the intestinal tract by way of the common and cystic ducts and also from the general vascular system, focal infection and chronic appendicitis being the source. Although it is thought that that organism rarely, if ever, reaches the gall bladder from the intestines by way of the portal vein. The tubercle bacillus, echinococci, round worm, amoeba coli and a few other *parasites* are possibly exceptions to this. But these organisms and parasites produce an infection of the liver first and secondarily involve the gall bladder.

The gall bladder having been bacterially invaded, assumes a different picture. The walls of the viscus receive a slight traumatism and are infected, the walls become infiltrated and thickened a pericholecystitis is produced with the formation of adhesions surrounding the gall bladder and between other viscera. The most common effect of these adhesions is to interfere with the proper emptying of the gall bladder contents, not infrequently the extension of these adhesions prevents proper emptying of the stomach and duodenum, thereby producing symptoms that are referable to these viscera.

Where the common or cystic ducts are partly obstructed by these adhesions there may be attacks of pain and jaundice which resemble that produced by stones.

We are all familiar with the formation of gall stones, how they are frequently formed from a mass of epithelium cells and bacteria as a nucleus, then the deposit of the various bile salts, bilirubin biliverdin, cholesterin, calcium, etc.

From our knowledge of the bacterial invasion of the gall bladder we can easily explain the etiology of acute and chronic inflammatory changes of this viscus, also those pathological conditions which are directly or indirectly the result of an inflammatory process, namely, catarrhal inflammation, empyema, lithiasis, gangrene, hydrops. We can likewise explain the etiological factors in tuberculosis of the gall bladder and the various parasitic involvements. Next, we deal with tumors of the gall bladder, primary carcinoma is most common in females, ratio of four to one, gall stones are found in practically all cases and the relationship between the two is a rather disputed subject. Some investigators regard the cancer as developing in the glands of the mucosa due to stone irrita-

tion while others look upon the stones as subsequent to the cancer. Primary cancer of the gall bladder usually involves the fundus by infiltrating the submucosa, the surface of the area involved may be smooth or ulcerated, the walls of the gall bladder are very much thickened and nodular, as the disease progresses the liver and peritoneum are involved and ascites is also noted at this time. Carcinoma of the gall bladder may be secondary to an involvement of the liver or bile ducts, but that is not considered in this paper.

Other tumors of the gall bladder are rather rare, but fibroma, adenomata are occasionally met with.

Now let us consider the symptoms referable to the gall bladder. The patient most commonly is a woman and it has been very aptly stated fair, fat and forty years of age, they complain of belching gas, epigastric distention, anorexia, nausea, vomiting, constipation and possibly jaundice, depending upon the anatomical location of the obstruction or the bile ducts. There may also be a sensation of fullness, pressure, tenderness or weight in the region of the liver, the pain or tenderness may extend around to the back and up to the right shoulder. The liver is enlarged and extends well below the costal margin. The gall bladder may also be enlarged and some writers say that in those cases where stones are present in a large gall bladder that they have been able to produce a rattling of the stones. These enlarged gall bladders, however, are not to be confused with a Reidel's lobe of the liver as is sometimes done. If the patient is suffering very severe pain they may assume a position that will relax the muscles on the right upper abdomen to a certain extent, this is accompanied by shallow respiration. There is also abdominal rigidity and localized tenderness. As the pain becomes more acute the patient may become bathed in perspiration and exhibit certain nervous symptoms such as hysterical seizures, accompanied by a rapid pulse and prostration.

In those cases suffering from recurring chills with fever and sweating there is a well-marked leucocytosis and if this type of involvement has progressed far enough, there is a very marked general pyemia with emaciation, weakness, a feeble pulse, prostration, and possible edema of the skin over the region of the gall bladder. There are also the usual abdominal symptoms as described above. These cases may be confused with intestinal obstruction as in some cases the intestinal symptoms are very well-marked.

Malignancy of the gall bladder is not so easily diagnosed, as a rule attention is first

attracted to an egg-shaped tumor below the costal margin, either of smooth or nodular surface, which is attached to the liver and moves with it on respiration. The tumor grows progressively larger and is accompanied by irregular pain which extends around to the back and is most marked at night.

Secondary nodules may be palpated on the liver, cachexia, accompanied by jaundice and ascites may occur. If metastasis occurs to the intestinal tract there will be marked intestinal symptoms. The course in these cases is as a rule very rapid.

The Meltzer-Lyon method is of value in diagnosing pathology of the gall bladder. Meltzer, in 1918, discovered that a 25 per cent solution of magnesium sulphate produced a relaxation of the sphincter muscles in the duodenal outlet of the common duct and a possible contraction of the gall bladder. Lyon applied this principle practically by introducing a Rehfu's or similar tube into the duodenum thereby aspirating the bile and duodenal juice. Microscopically and chemically noting their variation from the normal as an indication of gall bladder disease.

The x-ray contributes a valuable means of diagnosing these conditions, not in but few cases will stones show in an x-ray, depending upon their density, calcium content, amount of fluid in the gall bladder. Those stones containing a rather high per cent of calcium salts will show as rings and mosaics, only about five per cent will cast a solid shadow. Occasionally the gall bladder itself may show, if this is the case they are almost always regarded as pathological, further information may be obtained by observing the motility and contour of the stomach, distortion of the duodenum, when no pathology is present in these viscera that would produce a similar picture it may be regarded as due to adhesions originating from the gall bladder.

In practically all gall bladder cases some bile salts will be found in the blood and urine.

In closing, I might say that one of our most prominent surgeons has said that, "The aspic scapel offers the most certain means of diagnosing pathology of the gall bladder."

Tuberculosis in Region of Endemic Goiter.—Coulard found 100 families with goiter, representing 1,000 persons examined. There were 220 cases of goiter and 230 of known tuberculosis. The families seemed to be inclined to pathologic thyroids. In some it was too active and in others not active enough. None in this latter group had developed tuberculosis; it seemed to attack those with exaggerated thyroid functioning.

SECONDARY PAROTITIS*

By LEE KAHN, Louisville.

In explanation of the cause of secondary parotitis a number of theories have been advanced.

1. The pyemie theory. To its discredit two objections stand out, (a) that secondary parotitis occurred in cases where no septic element existed, and (b) that in those cases where the primary disease was of a septic nature necropsies showed no thrombi at the primary seat or septic emboli elsewhere.

2. The heat degeneration theory. On this Liebermeister explained secondary parotitis as a parenchymatous degeneration of the gland due to hyperexia, but as it occurred also without perceptible fever his view is not at all impressive.

3. The toxin excretion theory was advocated by Bouehard, maintaining that the gland is affected in its unsuccessful effort to excrete toxins manufactured by the organisms of the primary disease. It won but few adherents for parotitis has complicated diseases in which no toxemia was present.

4. The sympathetic or reflex theory was suggested by Paget after extensive clinical study of cases where parotitis occurred in diseases of and following operations on the ovaries, prostate, testes, generative organs of male and female. He recognized a relationship between the parotid on the one hand and the generative organs and peritoneum on the other and drew attention to the existence of a similar kind of sympathy between the same organs when the testicles or ovaries became affected in the course of mumps.

Although salivation of pregnancy and enlargement of the salivary glands in some of the lower animals in the breeding season supports this theory, the chief clinical evidence of a nervous connection between the parotids and the generative organs rests on the occurrence of orchitis in mumps. There is, however, not sufficient experimental proof of such a connection.

When a loop of a dog's intestine is drawn from the peritoneal cavity action of the gustatory nerve is inhibited and thereby salivary secretion is diminished or totally arrested until the loop is replaced. This might be adduced to show a reflex connection between the digestive tract and the glands but in admitting this we are mindful that arrest of glandular secretion is one thing and the production of glandular inflammation or pathology quite another. In a word, with the mod-

ern view of the microbic cause of inflammation sympathetic parotitis is wholly untenable.

5. The direct infective theory. Hanan and Pilliet were the first to assign the cause to direct infection of Stenson's duct by micro-organisms from the mouth. Finding on microscopic examination that the ducts of secondarily infected parotids were choked with debris containing micro-organisms and that the inflammatory process invariably began around the duct in the center of each lobule and spread toward its periphery and perilobular connective tissue where the blood vessels are situated, they concluded from this that it was an ascending infection and not of embolic origin, else the inflammation began simultaneously in the center of many lobules. Their conclusion was further borne out by Girode who found on taking cultures from the gland, the orifices of Stenson's ducts and the mouth, that the organisms from each growth were invariably identical and that the bacteria giving rise to secondary parotitis were not the same as that of the primary disease. In embolic parotitis due to empyema the germs in the parotid are identical with those of the primary disease and abscesses elsewhere in the body precede the parotid infection.

By experiments on animals Claise and Duplay have demonstrated that ascending infection of the parotid duct can only occur under one or more of the following conditions:

1. There must be at the orifice of the duct micro-organisms in larger numbers or of more virulent type than is usual.

2. The general vitality must be lowered to render the animal more liable to infection.

3. The parotid secretion must be reduced in quantity and quality.

In parotitis following operation—and it is with post-operative parotitis that this paper is particularly concerned—the above mentioned conditions pertain. Infection by way of the excretory duct is very plausible as it is well known that the mouth harbors numerous bacteria to the increased virulence of which, especially the staphylococcus, infection may be due. William Black has said that one-fourth of us have septic mouths at 25 years of age, at 45 nearly 90 per cent are septic and after 50 practically all mouths are septic. The mouth often foul to begin with, patients not infrequently come to operation depressed by previous illness and in consequence of the fever, constipation, vomiting, oral starvation and neglected oral hygiene they are rendered susceptible to ascending parotid infection. As dryness of the mouth and sali-

*Read before the Society of Physicians and Surgeons.

vary stagnation predispose to this complication cognizance must be taken of such contributing factors as prolonged general anesthesia, administration of opiates before and after operation, postural mouth breathing, especially after coliotomies where dorsal decubitus is long maintained, and not the least important is masticatory inactivity when the patient is restricted to a liquid diet.

Interesting in this connection is the study by Rolleston and Oliver of 1000 cases of gastric ulcer treated medically. They found that in 470 of these patients treated by oral starvation 21 or 4.5 per cent developed parotitis, while in 530 who were allowed something by mouth only two cases or 0.4 per cent suffered the complication.

These two patient were both on rectal feeding but permitted to suck a little ice. This study tends to show that oral starvation is a decided casual factor.

Josephson, analyzing the literature of post-operative parotitis, says it may develop after almost any kind of major operation requiring long anesthesia. He recognizes an undoubted connection between the genital and the salivary glands in so far as inhibiting secretions. The inhibited gland is consequently less resistant and this he believes is the only possible explanation for the exceptional frequency of secondary parotitis after operations on the ovaries. He says that it has rarely ever been observed after myoma operations, removal of inflamed tubes, vaginal hysterectomies or prolapse operations, and that it is the sudden removal of the functioning ovarian tissue which upsets the balance of internal secretions, and, as the salivary glands suffer particularly, parotitis follows.

Deaver says that in recent times the majority of the cases of secondary parotitis has occurred after severely infected conditions, appendicitis, peritonitis, perforating gastric ulcer, etc., that next to ovarian cyst gastric ulcer is said to be the most frequently operative condition which is followed by secondary parotitis. He attributes it to increased absorption of the intestinal contents in such cases and believes the complication occurs most frequently from "dirty bellies," where infection has probably resided and been active for some time, and where owing to incomplete or careless surgery secondary infection takes place.

As above indicated it was formerly thought that the operations followed by parotitis were almost invariably abdominal and pelvic, however, with more accurate observation post-operative parotitis is found not to be so narrowly limited. Paget and Auld report its occurrence after division of rectal strictures and hemorrhoidectomy, McDonald after amputa-

tion of the leg and Fisher after amputation at the hip; the writer has seen it follow two perineal prostatectomies and recently following a supra-pubic prostatectomy. It can be fairly assumed that there have been many more such cases unrecorded, where parotitis followed operations other than abdominal sections. When this is duly considered together with the fact that it occurs also in unoperated conditions, as reported by Donkin, Pepper, Hone, Rolleston and Oliver, in gastric ulcer, and as seen by the writer in a fracture of the tibia and in puerperal septicemia, and as has often been encountered in medical diseases where no abdominal or pelvic viscus was affected, one may then reasonably doubt that abdominal operations are, as is claimed, particularly liable to this complication.

Given as another cause is injury to the gland by the anesthetist. The relation of the parotid to the angle of the jaw makes quite obvious its liability to trauma by misdirected pressure in forcible manipulations of the jaw. Although in pugilistic bouts staggering blows are often dealt upon the gland yet on diligent inquiry of professional pugilists we could learn of no case of infective parotitis so incurred. The writer is unconvinced that injury per se is a cause.

Post-operative parotitis occurs from the fourth to the eighth day, beginning with pain, which becomes intense, owing to the resistance by capsule offers to the parotid swelling. It is referred to neighboring parts by the fifth nerve. Swelling appears early in front of the ear lobe where the capsule is less dense. Soon other parts of the gland are involved giving rise to a typical parotid swelling. The cheek becomes brawny, the eyelids puffed, the lips swollen and finally the whole side of the face becomes tense, shiny and, with tendency to suppuration becomes hot and red. Suppuration does not always occur but develops only when the inflamed gland is secondarily infected by pyogenic organisms, and when it does softening is first noted in the center of the swelling. Unless drained by incision the abscess ruptures into the maxillary joint, into the auditory canal, burrows into the chest or retro-pharyngeal space, drains through the duct into the mouth or rupture through the cheek.

The treatment is chiefly prophylactic, keeping the mouth clean and moist by its own secretions, giving the patient, to whom solid food is denied, gum and paraffin to chew. Chewing on a rubber tube, immersed in lime juice answers admirably in promoting salivary flow through the ducts. A bisected lemon placed at the bedside is, we believe, a good psychic stimulus to reflex secretion.

The treatment of infective parotitis is the same as that of any other acute inflammation or abscess. For obvious reasons there should be no delay in draining the abscess by a free incision in the parotid fascia, taking due care to avoid injuring Stenson's duct, the facial nerve branches and the external carotid.

Summing up, we believe:

1. Septic parotitis is of oral origin, the infection ascending the excretory ducts.
2. It may occur after any kind of operation requiring prolonged anesthesia.
3. Susceptibility is favored by interference with the normal parotid secretion and its protective action as it drains down the ducts, hence
4. By maintaining oral asepsis and free salivary flow before and after operation its occurrence will be a rarity.

A DISCUSSION OF THE DIFFERENT METHODS OF ANTIRABIC TREATMENT

By JAMES McL. PHILLIPS, Columbus, Ohio.

When rabies has made itself manifest no known remedy is of use as a curative agent. However, it should be emphasized that though rabies is generally regarded as a uniformly fatal disease, occasional spontaneous recoveries take place in naturally infected animals, and for this reason must be considered as possible in man. Under no circumstances should the sedative treatment be of such character as to endanger the life of the patient.

Prophylaxis resolves itself into the local treatment of the wound, and the immunization of the patient.

Local treatment.

This is very important, and will materially aid in preventing hydrophobia if promptly and thoroughly done, and is of value even after twelve to twenty-four hours have elapsed. This is not only indicated by clinical results, but has been proved by Poor (1) and others, on experimental animals. As cauterizing agents fuming nitric acid and formalin occupy preeminent positions. Carbolic acid and iodine (2) are useless. Local treatment should be applied even though it is necessary to anaesthetize the patient, as there is a relatively high, but no absolute immunity to rabies produced by antirabic inoculations. In extensive lacerations, infected with large quantities of virus, the local treatment may decide the issue, even though it was insufficient to prevent the disease *per se*. Such a quantity of the virus may be destroyed that the very high degree of immunity produced during the

course of antirabic treatment is able to overcome the virus remaining.

Immunization.

All biologic methods require the growth of the causative organism in pure culture before living vaccines, dead vaccines, or sera can be made. Rabies virus has never been artificially grown for practical use as an immunizing antigen. This difficulty is overcome by means of fixed virus. When rabies virus is passed through many generations of rabbits by cerebral inoculations it assumes an incubation period of from five to seven days. It becomes exalted in virulence for the rabbit, but is practically innocuous when inoculated subcutaneously into man and animals other than rodents, and will protect these against natural rabie infection. This is called fixed virus.

Since .0015 mg. of such a rabbit brain will usually kill a rabbit or guinea pig when inoculated intra-cerebrally, this brain can be used as a pure culture of a modified rabies virus. That such a virus is not absolutely innocuous is shown by the fact that occasionally the Pasteur treatment has been followed by a form of paralysis, which in some cases has proved fatal. This paralysis is probably a form of fixed virus infection, and seems to be due to some idiosyncrasy of the patient. The very slight danger from this cause is shown by the following figures, collected by Simon and summarized by Fielder (3).

METHOD	NO. CASES TREATED	PARALYSIS	PROPORTION
Classical Pasteur,	32,676	6	1:5446
Modified Pasteur,	8,657	16	1:541
Hogyes,	51,417	3	1:17139

Immunization by Antirabic Serum.

This serum is produced from sheep immunized by intravenous inoculation with fixed virus. As a curative agent it is a failure and as an immunizing agent its action, like that of all sera conferring a passive immunity, is too fugacious to be depended upon in a disease with an incubation period which may extend over months. In severe face bites the use of antirabic serum in connection with the earlier doses of vaccine would seem to have theoretical advantages, but its use in practice has not given any lower mortality than some other methods. Some institutes in this country used this method for a time, but we know of none that has not given it up as offering no advantages.

Pasteur treatments.

All forms of treatment in which the patient is actively immunized by the subcutaneous injection of fixed virus, suspended in a diluting fluid, are commonly known as Pasteur

treatments. A few authorities use killed virus, but most of them, including the U. S. Hygienic Laboratory and the Pasteur Institute of Paris, employ the living virus.

Original Dried Cord Method.

Pasteur (4) found that spinal cords of rabbits, dead of fixed virus infection, gradually lost their virulence, when dried over caustic potash, at a temperature of 20 degrees to 23 degrees C. They are avirulent by the eighth day. He began the treatment with emulsions of cords dried for fourteen days, and decreased the drying period daily until three day cord had been used. He then alternated weaker and stronger cords, in fixed series. His treatment lasted twenty-one days, and succeeded in reducing the mortality from approximately 25 per cent to about one per cent.

A more intensive form of treatment commencing with six-day cord and using one-day cord, originating in the Hygienic Laboratory, is now generally used. (5). This has decreased the mortality very greatly. Our results with 1680 cases treated by this method gave a total mortality of eight, or less than 0.5 per cent. This is about the usual average for Pasteur Institutes using this method. These deaths all occurred in severe face bites, and before the theoretical time, (fourteen days after completion of treatment) for the development of the greatest immunity had been reached. It should be noted here that many laboratories, in publishing their statistics, include as failures only those cases developing after two weeks from the completion of treatment.

In this series we had seven cases of treatment paralysis, all but one of which were mild.

The objections to the dessicated cord method are, the comparative frequency of treatment paralysis, the large amount of inert nervous tissue injected, the difficulty of keeping on hand a sufficient reserve of potent material tested for sterility, the impossibility of standardizing the dosage accurately, as the virulence or amount of virus from different rabbits, and from different parts of the individual cords, is variable. Finally, it has been shown by Dr. Poor (6) that other methods produce a much more prompt immunity in experimental animals. It possesses the advantage of having been thoroughly tested practically, and enjoys the confidence of our best immunologists, and the immunity conferred is thought to be more lasting than in some methods in which no living virus is used. In a disease which often has a very long period of incubation this is a matter of importance.

The Dilution Methods.

The drying process in the Pasteur method does not attenuate the organisms individually, but only lessens the virulence of the cords by lessening the number of living organisms in them. The moist core of a four-day cord will kill inoculated rabbits if about the average quantity required as a minimum infectious dose of fresh cord is used. The outer dried part is avirulent.

Hogyes (7) believing that the attenuation was numerical, devised his dilution method. He emulsified the fresh cord of rabbits, dead from fixed virus infection, in 0.7 per cent sodium chloride solution in the proportion of 1 to 100. From this stock solution he prepared the appropriate doses for each patient. His initial dose was 2c.c. of a 1 to 10,000 emulsion and his schedule of treatment called for a daily increase in strength until the maximum dosage was reached, 1c.c. of a 1 to 200 dilution, then he reverted to weaker dosage, and several times repeated the series. The treatment lasted from fourteen to twenty-one days.

Harvey and McKendrick (8) worked out fairly accurately a method of determining the virulence of rabies virus, according to the minimum infectious dose for rabbits by intracerebral inoculation. This method of standardization is not absolutely accurate, as living organisms, not toxins, are being tested. They found that .0016 mg. was the average M. L. D. of fresh cord. The interesting point is that according to the Pasteur scheme of treatment an equivalent of 2,160 M. L. Ds. of virus are given, which are contained in the equivalent of approximately 1.5 grams of fresh cord, and that Hogyes gave a maximum of 3,808 M. L. Ds. contained in a weight of 97.47 mg. of fresh cord.

The rarity of treatment paralysis under this method indicates that it is partially dependent on the amount of nerve material injected with the virus. The reported results of this form of the dilution treatment in preventing rabies have been somewhat better than the average Pasteur dried cord results.

The logical conditions of this method are, that in using cord instead of brain a larger quantity of inert nerve material is injected than is necessary, and that a less intensive schedule of treatment is used than most persons working with the various modifications of the dilution method are using today. The increases made by others in the intensity of the treatment are followed by a corresponding decrease in the mortality of the persons treated, without apparently increasing the danger of treatment paralysis. Another objection is that as no attempt is made to stand-

ardize the virus, accuracy of dosage is impossible.

The Harris Modification of the Dilution Method.

Vansteenberghe (9) discovered that fixed virus did not lose its virulence when rapidly dessicated, but when kept under certain conditions retained it for a long time. Harris (10) put this discovery to practical use, and devised an ingenious technique for dessicating and preserving the virus without destroying its infectivity, and applied the method of Harvey and McKendrick to its standardization, so that an approximate number of infectious units could be given on each day of the treatment. Harris also gives a much more intensive treatment, in a shorter length of time, than does Hogyes. Instead of oscillating between greater and smaller doses, he quickly reaches his maximum and then maintains this dose. This would seem to be a more logical procedure in view of our present knowledge of immunity.

When dried by the Harris method, rabies virus will maintain its virulence for at least 500 days if kept below freezing. At room temperature it loses its virulence with comparative rapidity.

Harris uses both brain and cord in the preparation of his virus, and begins the treatment with 250 M. L. Ds, using a material that has lost most of its virulence by being kept at room temperature. By the third day he gives a dose of 1,000 units, M. L. D., which is continued until about 10,000 units have been given.

In very severe bites he increases the daily dosage, and the length of treatment, until 30,000 or more units have been given in fifteen days. When the virus is prepared for injection, the required quantity of powder is mixed with salt solution, containing sufficient antiseptic to insure protection against air infection during its preparation. The emulsified virus loses its infectivity in a few days, in fact in less time than fresh virus emulsified in salt solution. The work of Poor shows that this method produces a very rapid and high grade of immunity. All in all it is one of the greatest advances in the technique of immunization against rabies.

There is absolutely no scientific or theoretical reason to suspect that the fixed virus is in any way changed by the drying to which the brain menstium, in which it is contained, is subjected. For this reason it is here described as a dilution method.

The greatest objection is the difficulty of keeping the material free from contamination during its manufacture, and the tedious and difficult technique of its preparation.

The advantages of the method are, the rapidly produced, intense and lasting immunity, comparative accuracy of dosage, and the fact that it is possible to maintain a large stock of standardized material, thoroughly tested for sterility and potency.

Methods Using Killed Virus.

The use of dead virus would prevent any danger of infection by fixed virus and this has led to the development of several methods.

Babes (7) prepared his virus by heating it to 80 C. for fifteen minutes. This method has been used extensively in Japan, with good results. Both experimentally and in practice, in our hands, it has not been found satisfactory.

Dr. E. F. Sellers, Chief of Laboratory of the Georgia State Board of Health, in a personal communication, says that he found that working with heated virus, the results were much less satisfactory than when the cord and dilution methods were used for the prevention of rabies in animals exposed to natural infection.

Fermi (11) killed the virus by exposure to one per cent phenol, and used it with excellent results, and this carbolized virus has been used extensively in India. We have been pleased with the experimental and practical results when working with this method.

Cumming (12) dialyzed the virus in collo-dion sacs against running water, until all infectivity was lost, and then added 0.1 per cent formalin to preserve it. He used a one per cent emulsion of the virus and gave it in doses of 2 c.c. He claimed a very high grade of immunity as a result of this treatment, a result which Poor was unable to confirm. At the present time a two per cent emulsion is used. Using this Poor found a rapid and high grade immunity resulting, provided freshly prepared material was used.

As prepared at present the fixed virus is first killed by mixing it with formalin solution which is then removed by dialysis. Trikresol is added in place of the formalin as a final preservation. Thus, the virus is killed by a chemical process rather than by dialysis, and we can see little theoretical difference between this method and that of Fermi.

Using the Cumming method we treated fifty-nine persons and several dogs. One of the latter died of rabies after the theoretical time for the establishment of immunity, and having learned of a similar result in a man, we discontinued its use, and decided to adhere to the more generally accepted immunization by living virus.

The possibility of testing for sterility all material before it is used, and the impossi-

bility of using fixed virus infection with dead virus, are the advantages claimed for the Cumming method. The ease and cheapness of manufacture would also recommend it from a commercial standpoint.

Combined Dead and Living Virus.

The method employed by us at present is, to give 60 mg. of carbolized *dead* fixed virus daily for three successive days. This is followed by daily inoculations of approximately 1000 M. L. Ds. of *living* virus. The treatment lasts from fourteen to twenty-four days according to the severity and location of the wound. In a few very terrible face injuries we have given considerable larger doses of living virus.

We use only the brain of the rabbit, as in this way the amount of inert material in the virus is reduced, thus lessening both the danger of neuritis and the intensity of the local reactions.

The virus is preserved by an original technique which will be described in a more technical paper, and is standardized by the Harris method.

In our last 1024 consecutive cases this method has been used. There have been no deaths during or after the treatment, from rabies, and but one case of treatment paralysis has occurred, which case recovered.

In the very extensive injuries we have never had sufficient courage to shorten the duration of treatment, as, in the event of failure we could not help feeling that we had not done all in our power to avert the catastrophe.

This method has the advantage of producing a high grade of immunity with the dead virus, and then gives the additional safeguard of the lasting immunity produced by large doses of living virus. The danger of treatment paralysis would seem to be lessened both theoretically and from the practical results. This is probably due, not only to the preparatory doses of avirulent material, but also to the small amount of nerve tissue contained in the standardized brain virus.

When we first used the standardized living virus method the treatment began with five and four day cord emulsions. These were followed by the living virus, using a less intensive scheme than we use at present. Later the cord emulsions were discarded, and were replaced by heated virus, the rest of the treatment remaining unchanged. There were no cases of treatment paralysis. Our mortality was somewhat less than under the intensive Pasteur cord method. After considerable experimental work we adopted the scheme outlined above, with results that are very gratifying.

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A BULLET WOUND OF THE FEMORAL ARTERY*

By W. EDGAR FALLIS, Louisville.

Mr. V. E., aged 17 years, while handling a 32-caliber revolver accidentally discharged it, the bullet entering the anterior inner aspect of the thigh about the juncture of the middle and lower third and lodged just under the skin posteriorly.

A local physician removed the bullet by making a small skin incision and attempted to establish through and through drainage. The wound was irrigated daily with hot water. There was very little hemorrhage until the following Monday, eight days after the injury, when a moderately severe hemorrhage occurred, which was very easily controlled by means of a simple pad and bandage.

We saw the patient the morning after the hemorrhage, nine days following the injury. Temperature 101 degrees F., pulse 120. Good volume and rhythm. Respiration 30. His facial expression was not anxious and he was not restless although his face and mucous membranes were very pale. The leg near the wound was very tense and hard but not extremely tender. There was marked discoloration of the skin. The foot was warm and the pulse was perceptible at the ankle. The dressing had not been changed since midnight and no fresh blood was present.

We advised the parents to let us take the patient to the city, build him up a few days and operate where things were more convenient and where all necessary assistance was at hand as we were 20 miles from any additional help.

After much delay and discussion we were permitted to bring the patient back with us. The trip was very tiresome and he seemed

*Read before the Jefferson County Medical Society.

much exhausted. He was given proctoclysis and nutritious diet for several days, endeavoring to improve his general condition before attempting any operative intervention.

We are frank to admit we did not believe any of the larger vessels were injured because of the ease with which the bleeding was controlled and the presence of the pulse at the ankle. We therefore decided that the secondary hemorrhage was due to the solvent effect of the infection upon the blood clots of some of the smaller branches.

We then concluded that it was best to open the wounds of entrance and exit, expecting to pack the wounds allowing them to heal from the bottom. But after opening these tracts we found such extensive hematoma that we made an incision along the line of the femoral vessels, and after opening the deep fascia began to dislodge great quantities of blood clot, when suddenly an enormous gush of bright red blood began to spurt. The accompanying hissing sound is one we do not care to hear again soon.

The bleeding was soon stopped by pressing the artery tight against the femur and holding it there until we would apply a tourniquet.

If you have not attempted to locate an opening in a vessel or even a vessel with a tourniquet applied when the tissues were discolored with dark clotted blood you will find it not an easy task, or at least it was not for us. But after due time and searching and splitting the femoral sheath high enough to get into tissue which had a normal color we located the artery and tracing it downward we soon found an opening large enough to admit the point of a pair of broad ligament clamps. In fact about one-third of the anterior surface of the artery was missing.

The patient's condition was critical. Time was an all-important factor and hoping that nature would or had attempted collateral circulation we ligated the artery above and below, released our tourniquet, found hemostasis satisfactory, closed the wound with silk-worm gut and packing the enlarged wounds of entrance and exit placed the patient in bed with the foot elevated.

Some intravenous saline had been given during the operation and proctoclysis was started as soon as the patient was returned to bed. Morphine was given in sufficient quantities to keep the patient quiet and in 48 hours his pulse was down to 100. After 24 hours the pulse could be felt at the ankle and the color in the toes was re-established although for six or seven days that foot was colder than the other.

The incision over the vessels healed by pri-

mary union and the accidental wounds were entirely closed in three weeks, the patient returning home on the twenty-third day.

In closing we wish to make three statements.

1. We think the injury we found in the artery did not occur at the time of the accident, but the outer coats were damaged and infection destroyed what remained.

2. That the results we attained i.e., the collateral circulation, was partially established before we ligated the artery.

3. That had we been persuaded to undertake this operation in the patient's home we are sure we would now have a great calamity on our hands.

TREATMENT OF POTT'S DISEASE*

By ORVILLE O. MILLER, Louisville.

The diagnosis of Pott's disease is not difficult, as a rule, especially after kyphosis has developed at site of the lesion. It is with cases at that stage of the disease the writer wishes to deal.

As in all other locations where tuberculous arthritis may develop the treatment is both local and general. The local treatment is fixation with extension. As is well-known, the tubercle bacilli lodge in the capillaries of the vertebral epiphyses and there cause necrosis which tends to spread toward the articular cartilages. As the necrosis extends the weight of that portion of the body above the process causes the collapse of the necrosed portions of the vertebrae. If the patient remains without treatment the tuberculosis process progresses and produces more widely necrosed areas. These areas also soon collapse by the weight on the spine above the lesion. In this way the kyphosis gradually becomes more pronounced and the patient grows weaker, not only from absorption of toxic material of necrosis, but also pressure upon vital organs following angulation of the spine the consequent compression of the chest and abdomen. The number of vertebrae involved may become so great that a kyphosis may form which is so angular as to cause total paralysis of all nerve roots emerging below the level of the lesion because of pressure upon the spinal cord. As the disease progresses fibrous tissue appears which is later replaced by osseous material and the spine thus becomes permanently fixed in a position of deformity.

It is to prevent permanent deformity that extension is applied in combination with fixation. During the active process the bodies of

*Read before the Jefferson County Medical Society.

the vertebrae are held apart by extension, thus preventing their collapse. Extension may be applied in a number of ways. The method of obtaining extension is important, in the opinion of the writer, inasmuch as one method is more desirable and perhaps more applicable at a given age than any other.

For complete continuous extension with fixation in children under the age of approximate five years, the Bradford frame is applicable and much more desirable than any other method of treatment. For extension with fixation in older children and adults, plaster jackets of the type advocated by Calot, or a plaster jacket with a jury mast in which the head may be suspended, may be employed. The operation of bone transplant devised by Dr. Fred H. Albee, of New York, is advisable in certain cases, usually in older children and adults. Other forms of treatment also have for their primary object fixation and extension of the spinal column to prevent collapse of the necrosed vertebrae upon each other until the process can be arrested; scar tissue is thus made to fill the space and final ossification occurs.

The Bradford frame is advocated for young children because; (1) Their skin is tender and pressure sores are easily produced; (2) they are better satisfied to remain in the recumbent position; and (3) the weight of the body is absolutely removed from the spinal column and extension is easily maintained.

In the wearing of a plaster jacket by such young patients, there are almost certain to develop pressure sores at the crest and soon the anterior superior spines of the ilium to which the head and body weight is transferred by the plaster. No matter how carefully applied the plaster may have been, there will almost certainly be a collection of foreign material, bread crumbs, etc., under it which will only serve as active factors in the production of sores. By the use of the Bradford frame the patient reaps all the benefits of extension and fixation with none of the disadvantages of the jacket. A daily bath may be enjoyed, massage of the skin of the back and the application of alcohol may follow, thus keeping vitality of the tissues and quality of the general circulation at normal standard.

At the beginning of this form of treatment, the patient is merely placed on the frame which is of a proper size for the individual. A jacket of canvas is made with holes through which the arms may be projected and made to fit snugly around the shoulder. The canvas fits snugly about the chest and abdomen and is firmly fastened behind or beneath the frame in such a way that the patient is unable to loosen it himself, nor can he move himself

upward or downward on the frame, but is firmly attached as though he had suddenly "grown fast" to it. As he becomes accustomed to lying in the same position, the frame may be bent in such a manner that the greatest angle will cause pressure on the kyphosis. The weight of the body combined with a backward curve of the spinal column serve to accomplish identically what the greatest amount of traction would allow, namely, separation of the bodies of the vertebrae, except it is done in a different way. By this method, as the frame is bent more and more, the bodies of the vertebrae are spread apart much as a fan is opened, and they are held apart so long as the patient is kept on the bent frame.

By the method of extension with the jacket, the amount of separation of the vertebrae depends wholly upon the amount of tension that may be maintained in the spinal column between the level of the chin and occiput and the level of the crest of the ilium. As has already been said this amount of tension will cause enough pressure to produce sores rather quickly in young children, and thus interfere to a greater or less extent with the treatment.

In older children and adults a plaster jacket may be employed with the aid of the Sayre suspension apparatus or preferably with the Roberts' frame. The Roberts' frame is a very simple apparatus devised by Dr. Percy Roberts, of New York. The principle of its application is the same as the Bradford frame inasmuch as the patient is held by canvas with marked backward bowing of the spine during application of the plaster about the abdomen and chest. A jury-mast may be incorporated in the plaster to maintain constant tension along the spinal column in combination with a marked sway-back. By whatever method the plaster may have been applied the jacket should be removed at the end of six weeks so the skin of the chest and abdomen may be bathed and massage given the parts which have been covered with plaster. After massage an alcohol rub will have a beneficial effect inasmuch as it has a tendency to harden the skin and thus sores are not so easily formed. There is always some atrophy of the skin and muscles during the time plaster is being worn. For this reason, also, it is necessary to remove the jacket at intervals of approximately six weeks; moreover, they become loose and inefficient after that length of time.

In the opinion of the writer, some form of efficient apparatus should be worn in all cases of Potts' disease where kyphosis is present. The apparatus should be continuously worn until the kyphosis is corrected, or until it has

been conclusively demonstrated by roentgen-ray examination and by experiment that the deformity has become an absolutely permanent fixation. In older children and adults, when the deformity has been corrected (if possible over-corrected) a bone graft may be employed after the method of Albee and satisfactory results obtained. If it seems preferable, Hibbs' or Hawley's operation may be performed. These latter procedures have been less satisfactory in the hands of the writer, however, than the Albee. In the Albee operation the patient is on the table a shorter length of time, less trauma is inflicted upon the tissues along the spinal column, and the final results are as rapid and as satisfactory in attainment as by any other method of procedure. The point should be emphasized, however, that the deformity should be corrected, and over-corrected if possible, before the graft is inserted. It is the aim of the Albee operation to transfer the weight normally supported by the bodies of the vertebrae to the spinous processes at the site of the lesion, i.e., the weight is transmitted from the one above to the one below through the medium of the graft inserted into them. After the graft becomes fixed in place by osseous union, and the patient begins to walk, the graft becomes stronger and stronger, according to Wolf's law, and there is complete fusion of the posterior spinous processes capable of supporting the spine and holding the vertebral column in the corrected normal position.

While local treatment is of great importance, it should not divert the attention from the general treatment. This is, of course, fresh air, overfeeding with easily assimilated food, tonics, syrup of hydriotic acid, exercise of the extremities, employment of the mind in those things which will remove the patient's thoughts from himself and cause him to find a greater amount of contentment with his lot during the long period of time nature requires for the process of repair of such lesions.

If in an emaciated condition the patient should show an increase in weight from one week to the next. An accurate record of the weight should be kept with a graphic record of the progress made in the improvement of the deformity. In this way the physician is never in doubt as to just how much success he is attaining in each individual case. And he is supplied at the same time with an indicator by which his efforts may be gauged.

F., aged three years, white, female, seen first on June 4th, 1916. The patient was found to be suffering with a high cervical Potts' disease. There was distinct paralysis of both lower extremities and paresis of the

upper extremities. She was immediately placed on a Bradford frame which had been bent in such a way as to extend the neck to a marked degree.

Within three months the paralysis had decidedly improved. Ten drop doses of potassium iodide were ordered to be administered three times daily. After six months the patient was able to "roll about" in a rolling chair. Motion had begun to return to the legs. In ten months the paralysis had almost completely disappeared. A Taylor brace with chin piece was applied and the patient was allowed to play about. At the end of one year there had been no recurrence.

During the entire period of treatment there were no pressure sores, no complications of any sort, and the results were all that could be desired.

X-RAY THERAPY*

By M. Y. MARSHALL, Henderson.

The popularity of the x-ray, with its bold illumination of hidden secrets, has appealed alike to the profession and the laity. The roentgenographic and roentgenoscopic methods of utilizing this form of energy have furnished us with perhaps the most useful weapon in our entire diagnostic armamentarium. It not only enables us to accurately diagnose and rationally control the treatment of fractures, but it furnishes us with invaluable evidence in varied morbid conditions of the bones and joints, the lungs, the heart, the sinuses, etc. By the ingestion or injection of various opaque media, the study of the hollow organs and inaccessible cavities of the body is made possible, as with the barium meal and clysma, and the injection of the kidney pelvis and ureters in pyelography. Conversely, by the injection of certain cavities with gases, we are enabled to outline the adjacent solid tissues by virtue of their greater density, as exemplified in pneumoperitoneum and ventriculography. The profession at large has some time since come to realize the assistance to be derived from the x-ray in the field of fractures, and is gradually, though slowly, beginning to appreciate its usefulness in other diagnostic fields; but that the passage of the ray through the tissues has certain definite effects on those tissues that may be utilized from a therapeutic standpoint is not generally appreciated, and roentgenotherapy is a terra incognita to the average practitioner of general medicine.

It is not my purpose in this paper to enter into a detailed description of the technique

*Read before the Henderson County Medical Society.

involved in x-ray treatment of the various diseases that are amenable to this form of therapy, but to discuss briefly a few fundamental questions that are involved, such as: the biological effect of radiation upon tissue cells, the matters of dosage and filtration, the danger to operator and patient, and the methods of protection against these possible untoward effects of the ray, with finally a brief indication of the types of lesions which are amenable to treatment by radiation.

The ultimate effect of prolonged exposure of any tissue cell to the x-ray is necrosis of that cell, a necrosis preceded by a type of degeneration in which the nucleus undergoes a shrinkage and becomes pyknotic, and vacuoles appear in the cytoplasm of the cell. Different types of cells possess different degrees of susceptibility to radiation, in general, the younger and more embryonic types of cells succumbing more quickly than the mature types. It is this varying degree of susceptibility which enables us to take advantage of the ray in the treatment of malignant conditions, since the cells of malignant neoplasms are of the embryonic type, those of carcinoma succumbing to an exposure of about 80 per cent of that necessary to destroy mature tissue cells, while those of sarcoma require only about 60 per cent for their destruction. It should be noted, however, that an exposure of these cells to less than a lethal dose will cause a stimulation of their growth, instead of the desired destruction. Thus, the necessity for thorough treatment becomes apparent, even at the risk of causing the destruction of some normal tissue. The cells which are destroyed undergo absorption, while the connective tissue in the immediate neighborhood is stimulated to mature growth, resulting in the replacement of the tumor by scar tissue. There are other minor concomitant changes, such as an obliterative endarteritis of the small vessels a leucocytic infiltration of the rayed tissue, etc., but the above mentioned changes appear to be the important ones.

The above considerations make it plain that the question of dosage in roentgenotherapy is extremely important. The unit of dosage, which is variously called the skin dose, the erythema dose, the epilation dose, etc., may be defined as that amount of radiation which will cause a temporary epilation of the radiated area, with a moderate transient erythema, but without any permanent damage to the skin. It should be noted in this connection that an amount of radiation greater than that necessary to cause a temporary epilation will bring about a destruction of the hair follicles and sweat glands, so that we have here a very effective method of treating

both hypertrichosis and hyperidrosis. But in the case of hypertrichosis, particularly on an exposed surface, and unless the number of objectionable hairs is unusually large, the slight danger of the development of a subsequent telangiectasis makes electrolysis the preferable method.

There are in general two methods for measuring the x-ray dose; the indirect and the direct. The former consists in setting the machine for a certain voltage, milliamperage, and distance, using a filtration and an exposure time that previous experience has shown will deliver a certain dosage. After the dosage has been carefully measured for a particular apparatus under the given conditions, by the direct method, this indirect method is reasonably safe and accurate. Of the several methods of direct measurement, two are in general use. In one of these, the Kienbock, small strips of photographic paper are exposed during the treatment and subsequently developed, the amount of darkening of the paper, as measured by standard shades, determining the exposure given. The other method depends upon the change that takes place in the color of a barium platinocyanide pastille under exposure to the ray. The change is from apple green to brown, and according as it is measured by radiometers of different makes, the dosage is expressed as so many Sabourond, Holzknicht, or Hampson units. Thus, one skin dose equals 10 X (Kienbock) equals 1B (Sabourond) equals 5H (Holzknicht) equals 4Ha (Hampson).

The radiation proceeding from the target of an x-ray tube is composed of rays of varying length, a so-called soft tube, or one which is backing up a parallel spark gap of, say, 3 to 6 inches, giving a bundle of rays in which those of longer wave length and less penetrating ability predominate, while a hard tube, with an equivalent gap of 6 to 10 inches, gives mostly short, highly penetrating rays. These less penetrating and more penetrating rays, respectively, are generally spoken of as soft rays and hard rays. The soft rays are mostly absorbed by the skin; thus, when a large amount of radiation is desired at some distance beneath the skin, the skin must be protected in some way from these soft rays. Or, in other words, if sufficient radiation to be effective is to be accumulated beneath the skin, the latter, unprotected, would receive many times an erythema dose, and a burn would result. This protection is accomplished by interposing between the source of the ray and the patient some substance which will cut out practically all of the soft rays, but allow the passage of the hard rays. This process is spoken of as filtration. The filters in

common use are aluminum, 2 to 6 mm. in thickness, and zinc or copper, one-half mm. thick. Again, when a bundle of x-rays passes through any substance, the molecules of that substance which absorb some of the rays become themselves sources of radiant energy, or in other words, give off secondary radiations. For the purpose of protecting the skin from the secondary radiations proceeding from the primary filter, a secondary filter, usually of sole leather, is placed between the primary filter and the skin.

With a reasonable understanding of the principles involved and a reasonable amount of care in the operation of an x-ray outfit, the danger to the patient and the operator is almost nil. More careful protection for the operator is necessary in roentgenotherapy than in roentgenography, because of the enormous energy output from the x-ray tube and the length of time of operation. The ideal method of protection is to have the treatment with the control boards and the operator outside. Lacking this arrangement, the modern table and tube inside a lead-lined cubicle, lead glass tube shield, lead-lined screen, leaded rubber apron and gloves, lead glass goggles, etc., offer very efficient protection for the operator.

In addition to the various filters used to protect the patients skin over the area treated, the adjacent skin is protected by means of the tube shield, the treatment cones and diaphragms, and layers of leaded rubber fabric or lead foil laid over the skin adjacent to the area under treatment.

The diseases amenable to x-ray treatment may be classed broadly as those suitable for superficial therapy and those suitable for deep therapy. Constituting the former class are quite a variety of chronic skin diseases, most of them very recalcitrant to other forms of treatment. They are all, however, either cured or materially benefited by the judicious application of the ray. These are: eczema, psoriasis, prurigo, lupus vulgaris, lupus erythematosus, tuberculosis cutis, acne vulgaris, lichen planus, trichophytosis, leukoplakia, sycosis vulgaris, papillomata, port wine naevi, hypertrichosis, hyperidrosis, chronic ulcers, keloid, rodent ulcer, and epithelioma. Among the conditions which are suitable for deep therapy should be mentioned: enlarged lymphatic glands, whether inflammatory, tuberculous, lymphadenomatous, sarcomatous, or carcinomatous; prostatic enlargement, exophthalmic goitre, uterine fibromata, uterine hemorrhage, Hodgkin's disease, splenomegaly, splenomyelogenous and lymphatic leukemia, tuberculosis of bones and joints, sarcoma, and carcinoma. Of course all of these diseases

are not equally amenable to the x-ray, and some of them are better treated in certain situations with radium, or by a combination of both x-ray and radium. Also it should be understood that x-ray and radium therapy are in no wise antagonistic to reasonable and conservative surgery. On the other hand, they are the most important adjuncts that the surgeon possesses, both from a diagnostic and a therapeutic standpoint. Further, there is, or should be, no contest for supremacy between the x-ray and radium. While it seems to be the consensus of opinion that there is practically no difference between the gamma ray from radium and a more penetrating variety of x-ray, still convenience of application in certain situations makes radium unquestionably the agent of choice, while more widespread conditions, such as pelvic metastases in uterine carcinoma, are better treated with the x-ray.

In closing, permit me to present a case. This boy, 12 years of age, some six months ago developed a cold abscess over the lower part of his sternum. He had been under the care of an orthopedist for the past two years for a tuberculous knee, which had practically recovered. The abscess was drained aseptically and injected with bismuth paste. A sinus developed and persisted for about three months, in spite of numerous bismuth injections and various forms of local treatment. As the sinus evidently led down to the sternum, I operated, dissecting out all the sinus and scar tissue I could find and curetting the bony cavity until healthy looking bone was exposed. I closed the wound without drainage and got primary union, but several weeks later there was a recurrence of the same trouble. I then gave him four x-ray treatments, with intervals of two weeks, using a 10-inch gap, with a filtration of 3mm. of aluminum and one-fourth inch of sole leather, administering 4Ha units to a dose. At the present time, about one month after the last treatment, there is a very slight bronzing of the skin over the area treated, a soft pliable scar, and the tuberculous condition has apparently cleared up completely.

I have not endeavored to present anything new or original in this paper, but when you consider the fact that in 1919, in Erlanger, Germany, a town of 27,000 inhabitants, 7,000 radiation doses were administered, keeping busy eight roentgen apparatus of the latest type for from eight to ten hours daily, and consider by contrast the small extent to which the profession in our part of the country is availing itself of this form of therapy, I think you will agree with me that a simple presenta-

tion of the subject, with a plea for a more extensive use of the x-ray in the treatment of disease, is not time wasted.

APPLICATION AND DEMONSTRATION OF CELLULOID SPLINTS*

By ROBERT T. PIRTLE, Louisville.

I have here a few celluloid splints that I want to show for your consideration. Celluloid, itself is used in many ways, in surgery, in plate form to build up noses, etc. A thick paste injected with a screw syringe to fill up sunken faces, following injuries. Perforated celluloid plates to dress large open wounds, to prevent dressings from sticking. Liquid celluloid makes a very useful and handy substitute for Z. O. adhesive plaster in traction. The traction strips being stuck to the leg or in C. P. acetone; it is non-irritating and adheres to the skin to from 30 to 40 days, standing a 40-pound pull if necessary. This same solution can also be substituted for "Sinclair's glue" that the English army orthopedics used so much of. In applying the "Sinclair traction skate" for extension of the lower leg in fractures. Celluloid is not affected by water, perspiration or climatic changes, therefore it can be used to coat the skin to protect it from discharges or to cover plaster Paris from urine. It is inflammable and care should be taken to warn the patient that such is the case. The splints here shown, as you see are not all finished. The finished ones are for an elbow and lower leg of an infant. The latter has been used, being worn by the patient three weeks of the seven he was treated for fracture of the tibia and fibula. The last week of the treatment he walked in it and softened the heel, as you see, the unfinished one is for a knee of a boy twelve years old.

The celluloid solution is like thick paint (this solution, is about 20 per cent) and is about right for making the splints, stockinette on account of its thickness is necessary to make good ones but plain cotton stockings can be used. The binding leather is not always used, as you can face the splints with some kind of cloth or stockinette itself. I prefer the leather as I think it makes a better appearance.

To make the splints is very simple and any one with a mechanical turn of mind should have no trouble. First, we take a plaster cast of the part we wish to make the splint for. The mold is obtained by applying to the part, roller bandage, plaster of Paris bandages to a thickness that will not break easily, when

you split the plaster to remove it just before it becomes firm. This form is then allowed to dry before filling it with plaster of Paris, it should be smeared with vaseline or dusted with talcum powder to prevent the plaster of Paris from adhering to mold.

The cast, after it is thoroughly dry, is covered with stockinette, with as many layers as is necessary, according to the size of the splint and strength desired. This stockinette should be sewed on tight so that no wrinkles will be in splint. Then coat after coat of liquid celluloid is painted on, each coat allowed to dry before applying the next one. About ten coats are all that is necessary, several can be applied in a day as it dries quickly. The celluloid is then split and removed to be finished. Never apply any more celluloid after removing the splint from cast as the splint will spring out of shape.

There are many and varied uses for these splints. Thomas collars for high cervical Pott's disease; they are often made in combination with light iron strips. Jackets for the later treatment of Pott's disease, especially the lumbar and mid-dorsal regions have been used with success. These splints are not very expensive when the time is not considered that it takes to make them. Sheet celluloid and C. P. acetone is used for the solution. Celluloid splints are recommended for their lightness and cleanliness, and are useful when a fixed dressing has to be worn for some time, such as in un-united fractures, tuberculosis of the knees, elbows, ankles, and spine. These splints I made but the idea is not new. I am sorry I have not a jacket to show you. I will be glad to answer any questions as far as I can on any point I have not made clear.

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Vaccination Treatment of Purulent Pleurisy.—

The recovery from streptococcus purulent pleurisy under the influence of vaccine therapy alone is reported by Dufor and Debray. The patient was a girl of 15, and the disease had developed slowly and the general health kept good. They have been equally successful in some cases of typhoid spondylitis several months after typhoid fever. There is little hope of benefit, they say, from vaccine therapy in acute cases.

*Read before the Muldraugh Hill Medical Society.

Kentucky Medical Journal

PUBLISHED BI-MONTHLY BY
THE KENTUCKY MEDICAL ASSOCIATION
Incorporated

Editorial and Business Office, Cor. State and Twelfth Sts.

Entered as second class matter October 22, 1906, at the Postoffice at Bowling Green, Ky., under act of Congress, March 3, 1879.

Subscription Price\$2.00

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Next Meeting Seelbach Hotel

Louisville, September 19, 20, 21, 22, 1921

COUNTY SOCIETY REPORTS

Boyd.—At the regular meeting of the Boyd County Medical Society the following officers were elected: W. O. Hopper, President; P. C. Saunders, Vice-President; M. H. Smith, Secretary; W. O. Hopper, D. M. Godbey, Fayette Dunlap, Censors.

W. H. SMITH, Secretary.

Caldwell.—At the regular meeting of the Caldwell County Medical Society the following officers were elected, L. O. Young, president; Frank Walker, vice-president; R. W. Ogilvie, secretary; J. M. Moore, Delegate; W. L. Cash, Frank Walker, J. M. Moore, Censors.

R. W. OGILVIE, Secretary.

Carter.—At the regular meeting of the Carter County Medical Society the following officers were elected, W. A. Horton, President; L. G. Nickell, Secretary-Treasurer.

L. G. NICKELL, Secretary.

Daviess.—The following officers were elected at the regular meeting, C. M. Rice, President; W. H. Strother, Vice-President; J. L. Rodman, Secretary-Treasurer; W. H. Strother, Delegate. Board of Censors, J. W. Barnhill, I. L. Denton, R. L. Schroeder.

J. J. RODMAN, Secretary.

Fayette.—At the regular meeting of the Fayette County Medical Society the following officers were elected: President, W. E. Bannister; Vice-President, J. T. McClymonds; Secretary-Treasurer, S. B. Marks; Delegates, J. W. Scott, C. C. Garr, S. B. Marks; Censors, David Barrow, R. J. Estill, J. C. Lewis.

S. B. MARKS, Secretary.

Graves.—The following officers were elected for the coming year: M. Hunt, President; D. H. Ray, Vice-President; John Dismukes, Delegate; W. S. Hargraves, Alternate; E. A. Stevens, G. T. Foller, Censors; H. H. Hunt, Secretary.

H. H. HUNT, Secretary.

Hopkins.—At the regular meeting of the Hopkins County Medical Society the following officers were elected: R. F. Robinson, President; C. E. Frances, Vice-President; C. R. Morton, Secretary-Treasurer; W. M. Hammond, Delegate; A. W. Davis, I. J. Townes, Censor.

C. W. MORTON, Secretary.

Henderson.—The Henderson County Medical Society met in the office of Dr. George M. Royster at 8 o'clock P. M. in regular session.

There were present, Drs. Yanner, Smith, Mar-

shall, Neel, White, Forwood, Powell and Ligon. Meeting called to order by Vice-President C. R. Yanner. Minutes of previous meeting read and approved as read. Motion made by Dr. Marshall that this Society go on record as favoring the return of permits to prescribe alcoholics. Motion made by Dr. Neel that Dr. Marshall's motion be amended to bring the matter before the Society at our next regular meeting on February 28, 1921, and that the secretary be instructed to notify every physician in the county of the meeting. Dr. Neel's motion was carried.

Motion made by Dr. Smith that we have printed new copies of our constitution and by-laws, and that the chair appoint one or more members to write the history of the Henderson County Medical Society, and have same printed in the State Journal. Said motion carried.

The chair appointed Drs. Letcher and Smith to write said history.

Motion made and carried that the chair appoint a committee to prepare resolutions to be presented at our next meeting, setting forth the views of the Society relative to the return of permits to prescribe alcohol. Drs. Neel and Marshall were appointed.

Motion made and carried that the chair appoint a committee to look out for a more suitable place to hold our meetings. The chair appointed Drs. Moseley and Ligon.

W. V. Neel read a very interesting paper on "Some of the Obstacles to the Study of Materia Medica." The paper was highly complimented and freely discussed, and was requested to have same published in the JOURNAL.

PEYTON LIGON, Secretary.

Harrison.—The regular monthly meeting of the Harrison County Medical Society was held at the Elks' club rooms March 7, 1921. The following members and visitors were present: Drs. Carr, Chamberlain, Rees, Wells, W. B. Moore, Morgan, Swinford, Martin, N. W. Moore, Givens, McDowell, Beckett, McIntyre, J. W. Renaker, and Drs. C. M. Paul and McCarty, of Cincinnati.

Meeting called to order by President Josephus Martin. Minutes of February meeting approved as read.

W. H. Carr reported several interesting cases.

N. W. Moore read a paper on "X-Ray Diagnosis and Therapy;" paper discussed by J. E. Wells, Rees, Carr, Givens, and McCarty.

Dr. McCarty read a paper on "Infections of Middle Ear," which was very instructive to the general practitioners.

J. E. Wells, Carr and Givens discussed the paper.

Meeting adjourned to lunch with Miss Gates, Supt. Harrison Hospital.

W. B. MOORE, Secretary.

Hardin.—The regular meeting of the Hardin County Society was held with the following present: J. C. Mobley, President, presiding; Alvey, English, Strickler, Roger, Aud, Nusz, Layman and McClure.

There was no regular program and the time was devoted to the report and discussion of several interesting cases. These informal meetings of the Hardin County Medical Society are always, to my mind, the most interesting and profitable.

The meeting adjourned at 3 P. M.

D. E. McCLURE, Secretary.

Laurel.—The Laurel County Medical Society elected the following officers for the ensuing year: J. W. Crook, President; G. S. Brock, Vice-President; O. D. Brock, Secretary-Treasurer; J. W. Crook, Delegate.

OSCAR D. BROCK, Secretary.

Livingston.—The following officers were elected at the regular meeting: J. L. Hayden, President; Roy Waddrell, Vice-President; E. Davenport, Secretary; J. E. Fox, Delegate; F. V. Matlock, Censor.

E. DAVENPORT, Secretary.

Logan.—The following officers were elected at the regular meeting of the Logan County Medical Society: J. K. W. Piper, President; W. R. Burr, Vice-President; Walter Byrne, Jr., Secretary; S. P. Alderson, Delegate; J. R. Crittenden, J. L. Farmer, T. H. Turner, Censors.

WALTER BYRNE, JR., Secretary.

Monroe.—At the regular meeting of the Monroe County Medical Society the following officers were elected: J. T. Smith, President; J. F. Marrs, Vice-President; R. F. Duncan, Secretary; G. W. Bushong, Delegate.

R. F. DUNCAN, Secty.

Mason.—At the regular meeting of the Mason County Medical Society the following officers were elected: L. H. Long, President; P. G. Smoot, Vice-President; J. H. Samuel, Delegate; W. H. Faulkner, Alternate; A. R. Quigley, Censor for three years.

W. E. HARD, Secretary.

Mercer.—The following officers were elected at the Mercer County Medical Society meeting: F. D. Haston, President; E. V. Seay, Vice-President; J. Tom Price, Secretary and Delegate; T. A. Wash, J. B. Robards, C. W. Sweeney Censors.

J. TOM PRICE, Secretary.

Nelson.—At the regular meeting the following

officers were elected: President, S. A. Fox; Vice-President, B. E. Gore; Delegate and Secretary, Hugh D. Rodman; Censors, B. E. Gore, R. H. Greenwell.

H. D. RODMAN, Secretary.

Taylor.—At the regular meeting of the Taylor County Medical Society the following officers were elected: President, W. R. Elrod; Vice-President, T. J. Buckner; Secretary, C. V. Heistand; Delegate, J. L. Atkinson; Censors, B. T. Black, W. R. Elrod, C. E. Murphy.

C. V. HEISTAND, Secretary.

Todd.—The following officers were elected at the regular meeting: R. L. Boyd, President; B. E. Boone, Vice-President; W. E. Bartlett, Secretary; C. M. Grover, Delegate; E. W. Weathers, B. E. Boone, J. F. Standard, Censors.

W. E. BARTLETT, Secretary.

Washington.—The following officers were elected: President, R. J. Hamilton; Vice-President, M. W. Hyatt; Secretary, J. H. Hopper; Delegate, W. T. Barnett, Alternate, J. H. Hopper; Censors, J. N. Shehan, W. R. Thompson, W. T. Barnett.

J. H. HOPPER, Secretary.

THE FORUM

TO THE EDITOR:

A letter addressed to the readers of the Journal is never harmful—I imagine—unless the writer thereof “spills the beans.” In Western vernacular, the term “spilling the beans,” has two meanings: one that of telling tales out of school; the other, taking liberties with truth. Anyhow, it is a common expression here and is employed by the kid and his mother alike, when occasion demands. This is a funny world—none are perfect—we all flounder semi-occasionally. The definition of a lie as given by the Sunday school scholar to his lady teacher was, “A lie is an abomination in the sight of the Lord, but an ever present help in time of trouble.” What a wonderful opportunity was given that good boy by his teacher to call to the attention of the inexperienced by his definition. It was a knick-knaek.

In this communication I shall endeavor to keep in the middle of the road. I will promise you, at the beginning, I haven't a thing that is rare, rich or racy to distribute. As we grow older, our minds revert to the past, we think of things half a century ago. They bob up and down like a cork on a fish-pond—matters and things related to us by our fathers and mothers. A little thing in my personal history, I must not omit to tell you. It is

not novel, for every physician has had a case or cases similar to it. It is related of me that I was born at a very early period of my existence. My grandmother, Margaret O'Connor, noticing the red-haired youth lying before her, was not performing as he should, instinctively grasped me by the heels and ran to the rain-barrel which stood at the end of the cot and immersed me more than once. I responded nobly and like little Boy Blue of Mother Goose fame have been blowing my own horn ever since. My grandmother was known to her neighbors as a woman of great perspicuity, of quick repartee, with a flavor of Killarney and with an aim in life to get results, and she usually got them when they were gettable. It is well that my appearance occurred on the 26th day of June, when the weather was balmy and clammy, rather than in January, as the shock from the immersion in water standing out of doors more than likely would have put me into Limbo.

What we want while tabernacling here is results, and that should be the slogan of every one, especially that of the physician, who, in his younger days is apt to dawdle, and like Macawber, wait for something to turn up. Unless he goes after it with shovel and tongs he will never have any results which accomplish anything, and as the years go on, as does the brook, he will lose that good opinion of himself that he had at the beginning of his career, when he had forty remedies for every disease and after a practice of forty years he has one remedy for forty diseases and the patients do just as well, provided they recover. We all know that the practice of medicine is a melancholy attendance on misery—a mean submission to peevishness and a continual interruption to pleasure, but we love it. While pursuing it, however, let us play a little and work a little, but determined in mind that we shall have results.

Pardon my moralizing—my grandmother's desires for results suggested it. Her memory must ever remain green with me. She lived to the age of 99 years and took a long horseback ride just for exercise the day before her departure for the Great Unknown. She has now been sleeping many, many years—peace to her ashes. I will relate to you now an incident (the Editor may term it a reminiscence) which will be news to many.

I landed on the shores of Zion in Salt Lake City, March 21, 1905, with a light heart and a thin pair of pants. The Rockies were before me, heavily covered with snow—I shivered. I stepped up to a hackman at the station like a tenderfoot (autos were not then in vogue) and asked him to take me to the best hotel in town. He jazzed me to the Wil-

son. I stepped into the corridor of the hotel and there met Mr. Harvielle, who had come up from Mammoth to greet me. It was 11 o'clock in the morning. We had a very pleasant talk and at 12 o'clock the gong announced that dinner time had arrived. My toothsome teeth and tasting nerves were in fine plight—the diner on the Pullman hadn't been satisfactory. We walked into the dining hall and the first thing to attract my attention was a huge glass tank filled with fish, which I was told were mountain trout. I thought to myself, "Surely, this is the West—how different from Kentucky taverns." The chef approached and said, "Would you like a trout? If so, make your selection. I will catch him and serve him to you in a jiffy." The meal was delicious, after which we repaired to the lobby, while directly a rugged man, with his breeches in his boots, wearing a wide sombrero, came in and said aloud, "Sight-seeing bus at your command: 25 cents round trip. Visit the Tabernacle and hear a pin drop." The trip was made—the Tabernacle reached just in time for the recital on the great organ, which we heard. The services being over, the crowd dispersed—the Mormons going one way and we another, but the trick of testing the acoustic properties of that great house by the dropping of a pin from the second balcony never took place. The next day Dr. Harvielle and I came to the Tintic Hospital, located in the mining town of Mammoth—situated as it is in the Great American Desert, a country of magnificent distances, without the intervention of a shrub. The following day I looked about me with astonishment—nothing reminded me of home, some 2235 miles away. In the kitchen I found a cook from Norway, the nurse was from Holland, and the boy who did the chores a Finn. I accustomed myself to my surroundings, prescribed for the many miners who came to the hospital, made the acquaintance of the cows and cactuses, and in the course of the week, Dr. Charles Poplin thought I was sufficiently familiar with matters and things to permit him and his wife to go to the city and witness the opera of Ophelia. Then Pelion piled upon Ossian—troubles began in earnest. Neither the streets nor the houses were numbered and to answer a phone call was like looking for a needle in a haystack. I have never been noted as a scary person, but was frightened nearly out of my wits when going over to Silver City at 12 o'clock one night by a flock of magpies, which were huddled on the ground, and which I supposed to be wild Westerners ready to attack when I came within hailing distance. The light was hid by the mountain gray—I couldn't see a thing.

only heard voices. My impulse was to run, but summoning courage I proceeded on my way and soon saw the lights of Silver City. After many inquiries from persons traversing the streets, I came to the house to which I had been called. I related to the lord of the manor my experiences and he laughed and said, "The talkers were only magpies. Your coming had disturbed their slumbers and they were only complaining at you."

The month of April was one of magnificent sunshine. In the latter part of the month I was greeted with a letter from Salt Lake City and signed by Union Worthington. Who Union Worthington was I had no more idea than the man in the moon. The letter stated in a very business-like way that the City and County Medical Society of Salt Lake would meet in the County Building on the evening of May 6, and that it would give the Utah doctors pleasure if I would come and read a paper before them. I didn't make much ado about that matter but "tumbled to the racket" at once. I had brought with me nothing like a paper which I could thresh over as old straw and spring upon them. Nothing remained but for me to work on a new topic, and I selected as my subject "Prognostics in Medicine." If this had been a warm climate I would have perspired, but I wrote and rewrote and on one good day I finished my labors. There were no woods for me to go into and speak to the trees. There was nothing before me but the shifting sands—I was in the desert. The coyote, the lynx, the bobcat and the mountain lion wouldn't quiet themselves to hear me. I was in a peck of trouble. Another letter came from Union Worthington, who I now supposed must be a doctor, stating that he would meet me at the train, and take me to his home as his guest for the evening. May 6 came bright and glorious. I bought a ticket over the San Pedro, Los Angeles and Salt Lake railway and left Tintic Hospital at 11 A. M. I knew not a passenger, but I happened to take a seat near a gentleman who I learned was Mr. Diehl, editor of the Mammoth Record, and whom I found to be an interesting gentleman, and who pointed out to me, on this, my first trip to Salt Lake City from Mammoth, many places of interest. Arriving at the City Station, I alighted and looked about for my friend. No one met me. I thought to myself that maybe I did not look like a doctor, though I had on my low neck and short sleeves—sufficiently toggled, I imagined, to visit a cabaret. A coupe took me to the Wilson. Once in that hostelry, I saw a young lady sitting at a typewriter. I sidled up to her and asked if she would please look in the

directory and find the name of Dr. Union Worthington, and his address. She did so kindly and I asked permission to use the phone. Dr. Worthington stated to me that he was busy with a surgical case at the time of the train's arrival and that was the reason he had not met me. He suggested that I take a coupe standing at the curb—giving me the street and his house number. I followed direction. Once at the house, I pressed the button. A lady appeared and asked if this was Dr. Bailey. She introduced herself as Mrs. Worthington, invited me to a seat in the parlor and talked to me very pleasantly. Dr. Worthington came directly and shook hands with me like an old friend. Still I was in doubt as to who this Dr. Worthington I see now before me. He knew me but I didn't remember him. At length he told me that he was from Danville, that he was a student in the office of Dr. McMurtry and that he often had seen me when I came to attend the meetings of the Central Kentucky Medical Society. The mystery was solved. He had learned from the Kentucky State Medical Journal that I was visiting in the State of Zion. Supper was announced at about 6 o'clock. I was unaccustomed, as a matter of course, to the manners of the West. Instead of tea, coffee, or milk, we had elegant Schlitz to help make the swallowing movement of the delicious supper. Now, I had hardly ever tasted beer in my life. It was delightful to the palate. I fell in love with it, but whether the three glasses I had drunk at table would make G sharp A flat, the Lord only knew. I reasoned as I went along that I might as well be killed for a sheep as a lamb, and so I continued my potations. It was the finest thing in the world for me. It gave me enthusiasm and I never read a paper before a medical society with so much zest as on this occasion. The doctor and I arrived on the third floor of the City and County building at 8 o'clock. The minutes of the previous meeting were being read. That over, the president arose and stated that the paper of the evening would be presented by Dr. Steel Bailey, of Kentucky. Dr. Worthington announced that I was present and he then escorted me to the rostrum. I was sustained and soothed by Mr. Schlitz. The paper was highly complimented. A newspaper man came and asked me to give him the manuscript. The paper appeared in full in the columns of the Tribune the next morning. Who was the newspaper man? Gene Lee, from Paducah, and who had reported the proceedings of the Kentucky State Medical Society in May, 1903. I learned from remarks made by several gentlemen present, that the Utah State Medical

Association would have its first meeting at 10 o'clock the following day. After the session was over and an introduction had come from members representing all parts of the State, we repaired to the Alta Club, where I was the guest of honor. Here was more trouble for my anatomy. Viands of all kinds were in evidence. The supper was delightful and served most elegantly. I came out unscathed. There sat next to me Dr. Jones, of Provo, president-elect of the Utah State Medical Association. He told me he had heard of my long connection with the Kentucky State Medical Association as its secretary and recently as its president. He said he was totally unacquainted with parliamentary tactics. He knew not how to open a session nor how to close one and asked me if I would not act as his substitute on the morrow. I gladly accepted the post and so was the acting president at the first meeting of the Utah State Medical Association. Was not that honor enough for Kentucky? Was it I that was the *piece de resistance*? No, my friends. I had worked in the Kentucky state association and the Central Kentucky Medical Society as an humble member for many years, and it was through these reputable associations that I had become known to Dr. Worthington and through him received the call to deliver the address about which I have already told you. These two societies were the power behind the throne. They furnished the main-spring and I got the results.

If there be any or many medicos without the pale of the great state association let me advise that they seek membership at once. You cannot tell the day or the hour when you may need help. It helped me and it will help you. My advice, then, is that you grasp it, clasp it, put it in the hollow of your hand, and caress it as you would a pearl of greatest price. Without it I could never have practiced medicine in Utah, Nevada, in Arizona and in California. A hint to the wise is sufficient.

Now, my dear Editor, precious things are usually put up in small packages. Lest I override the rules of the Journal by giving you too much linked sweetness, it were better, I think, to content your mind, which is a perpetual feast, by drawing down the blinds and asking you to remember that I may do better, if permitted, on some other occasion.

With best love to all my pals, young and old, of the great Kentucky State Medical Association, I am, as I shall ever be,

Yours truly,

STEELE BAILEY, SR.

MAMMOTH, UTAH, MARCH 6, 1921.

KENTUCKY MEDICAL JOURNAL

BEING THE JOURNAL OF THE KENTUCKY STATE MEDICAL ASSOCIATION

Published Under the Auspices of the Council

VOL. XIX. 

BOWLING GREEN, KY., JUNE, 1921

No. 6

EDITORIAL

ANNUAL CONFERENCE OF COUNTY AND CITY HEALTH OFFICERS

It is important that all county and city health officers and others who may wish to attend the Health Officers Conference to note that date of of this meeting has been changed from May 30 to the week beginning June 20. It is considered necessary to make this change owing to the fact that the Conference of State and Provincial Health Officers will be held in Boston, beginning June 1, and it is necessary that several of the officials of the State Board of Health be in attendance at that meeting.

It will not be necessary to repeat that the law makes it compulsory upon all county and city health officers to attend this Annual Conference, and it is hoped that nothing except an emergency will keep a health officer away.

The public health nurses will be in conference during the same week, this latter Conference being held under the supervision of the State Director, Miss Marian Williamson.

After organizing on the morning of June 20, the day's program will be devoted exclusively to a symposium by the full time health officials, and as this will be one of the most important features of the conference, it is hoped that every health officer will have been registered early that day.

Every phase of public health work will be brought out in the papers and discussions during this week's meeting and it should prove one of the most interesting and instructive Conferences ever held in the State. It is hoped that many members of county and city boards of health in the State will join their health officer in attendance upon this important meeting.

THE NEW BUREAU OF CHILD HYGIENE

As the Bureau of Child Hygiene has just been organized, the program of the Conference was planned so as to acquaint all health officers with the plans of the bureau. Dr. Talioferro Clark, Surgeon in Charge of the Division of Child Hygiene of the United States Public Health Service, Washington, D. C., has been invited to give an address on "Child Hygiene the Foundation of Health Work," on Tuesday morning, June 21.

Following the address, Dr. Edith B. Lowry of the United States Public Health Service, will explain a working program for child hygiene work in rural communities. Just how to start the work and the various steps leading to a complete program will be explained in detail.

From 11 to 12 o'clock, Dr. A. S. Veech, Director of the Bureau of Child Hygiene for Kentucky will demonstrate how to make a physical examination of a school child. Those who are familiar with the work Dr. Veech has been doing in the Louisville Schools will appreciate the value of this practical demonstration.

At 1 o'clock, Dr. A. N. Pickett, who has charge of the prenatal work at the Louisville City Hospital, will explain the problems to be met in prenatal work and its great value to any community.

Supervision of midwives is an important undertaking of the Bureau of Child Hygiene and the plans that are to be carried out throughout the state will be explained.

From 3 to 4 o'clock there will be a round table conducted by Dr. Edith B. Lowry. Health officers are requested to come with questions regarding their individual community problems, also with a concise explanation of any plan they have found of value.

THE SCHICK TEST

Recently a bulletin was mailed to every physician in the State giving in detail a description of the Schick test and the use of the toxin-antitoxin mixture.

The Laboratories of the State Board of Health has a full supply of these valuable agents, and we earnestly urge the physicians to make use of them.

Three hundred lives annually sacrificed in Kentucky to diphtheria, the fearful scourge of infancy and young childhood, can be saved, and the yearly illness of more than 3900 children can be avoided. It is not too much to say that in time diphtheria can be practically eliminated by the proper and universal use of the Schick test and diphtheria toxin-antitoxin mixture.

Extensive experimentation and clinical use of the above measures have shown the reliability of the Schick test for determining susceptibility to diphtheria. The harmlessness and efficacy of active immunization by injection of a combination of properly balanced toxin and antitoxin—diphtheria toxin-antitoxin mixture—have been demonstrated beyond question. The public is rapidly becoming educated to the efficiency and advisability of prophylaxis of disease by vaccination. Its cooperation is certain when it is convinced of the safety and value of the procedure.

These products are manufactured under the personal supervision of Dr. J. F. Anderson of the E. R. Squibb & Sons laboratories.

VACCINE THERAPY THE MOST RATIONAL AND EFFECTIVE METHOD OF PREVENTING WHOOPING COUGH

Under the above caption Dr. Chas. J. Bloom and George J. De Reyna, of Tulane University, New Orleans, have contributed the following on the value of whooping cough vaccine in the April number of the New Orleans Medical and Surgical Journal. The laboratories of the State Board of Health prepare this vaccine for free distribution. As we desire to establish its value as a preventive, physicians are requested to report their results:

During the month of April, 1919, five cases of whooping cough were noted in the St. Vincent's Foundling Orphan Asylum, New Orleans. The cases in question were discovered in different wards, in the second stage of the disease. Practically all of the children had been subjected to infection. Promptly these children were isolated and an attempt was made to limit the further spread of this serious malady.

The writers appreciating the prophylactic virtue of the Pertussis vaccine decided to use this method, in the hope of eradicating this disease. In order to impress the value of the results obtained, it might not be amiss to give the readers a brief mention relative to this institution. This asylum cares in the main part for the greater number of illegitimate children born in this institution, city, and in neighboring parishes. A large per cent of those admitted are marasmic; others show different manifestations of malnutrition; and many give signs of congenital lues. The resident population is constantly changing inasmuch as many of the children are adopted, and the older ones are sent to different institutions for further care and permanent abode. The dietetic consideration is seriously wanting, and even though some children have remained in this institution for a period of three or four years they are more or less under par.

The institution is overcrowded and the buildings are old and antiquated. These facts are given not in the way of disparagement but simply to demonstrate forcibly that even with serious handicaps in the way of birth and environmental factors—these children did not contract whooping cough although they were intimately exposed to this disease.

THE CASES:

Under 1 mo. (youngest case 10 dy).....	13 cases
1 mo.—6 mos	50 cases
6 mos.—1 yr.	34 cases
1 yr.—6 yrs.....	107 cases
Total	204 cases

The Vaccine.—The vaccine employed in this institution was a mixed stock vaccine, (recently prepared within one month). No preservative was used in the manufacture of same. Each c.c. of this vaccine contained 5,000,000,000 Bordet-Gengou bacilli and 3,500,000,000 influenza bacilli.

The Method.—Infants under 6 months, $\frac{1}{4}$ c.c., 3 doses, on alternate days. Infants from 6 months to 1 year, $\frac{1}{2}$ c.c., 3 doses, on alternate days. Children from 2 to 6 years, $1\frac{1}{4}$ c.c., 3 doses, on alternate days.

The Results.—In previous years not less than fifty per cent of the entire number of children living in this institution contracted whooping cough. From the first week in May, 1919, to the first of January, 1920, there was not a new case of whooping cough noted in this institution. It is evident that the prophylactic use of this vaccine has untold possibilities in the prevention of whooping cough in asylums, schools and public institutions, and in the limiting of disastrous epidemics.

ORIGINAL ARTICLES.

DISTURBANCE IN CARDIAC
FUNCTIONS.*

By JOHN E. GREIWE, Cincinnati.

The study of cardiac irregularity has for several years been a "hobby" with me, and as a consequence the subject has been accorded an unusual amount of thought and attention. Doubtless every physician present can recall the time when practically every patient exhibiting marked disturbance in cardiac function was thought to have acute or chronic myocarditis, and erroneous clinical diagnoses were made accordingly. The fallacy of such teaching need hardly be emphasized at this time.

As an illustration I recall the case of a man aged 70, admitted to the Cincinnati Hospital twenty years ago. Examination showed evidence of arteriosclerosis accompanied by considerable cardiac irregularity. As was then the custom in such cases a diagnosis of chronic myocarditis was made. The next morning when this man was examined his pulse was found to be absolutely normal and regular. The nurse was asked what had been given him during the night, or since my previous visit, and she replied "nothing but a large dose of castor oil." His cardiac irregularity had entirely disappeared! Since having studied more carefully various forms of cardiac disturbance I can recall many similar clinical pictures. That patient was kept under observation for ten days; he had no further cardiac manifestations; he was cured of his "chronic myocarditis" in one night by a dose of castor oil!

During the last few years the progress made in the study of cardiac function has been most satisfying and illuminative. Competent observers are now able to recognize various types of cardiac irregularity and differentiate organic from functional disturbances. It is true, however, that some times organic lesions and functional disturbances may coexist, requiring prolonged observation and study of the patient, with the aid of graphic records, to determine the exact nature and cause of the manifestations present.

Eight years ago Thomas Lewis, of London, stated to me that the subject of heart irregularities was a closed book; and his statement is true today with a great many observers, i.e., it is a book which they have never fully opened. It is also a fact that Lewis later

changed his mind and based on new material found in his work has since written the most important pages of the book which was supposed to be closed. Wenekebaeh, Tawara, Josue, Keith, Flack, Lewis, Maekenzie and a few others are largely responsible for the pioneer work which has been accomplished along this line of investigation.

To me the life of James Maekenzie has been the greatest inspiration. When it is remembered that it was a busy general practitioner who made such accurate clinical observations and deductions the results seem little short of marvelous, and the work done by Maekenzie has made him famous among physicians of the world. When one recalls the difficulties under which he worked, at first without the aid of graphic methods, and the process of reasoning by which he endeavored to differentiate clinically between the various forms of cardiac irregularity, the tremendous importance of his efforts may be realized. He finally compelled physiologists to completely rewrite the physiology of the cardiac mechanism, investigations having shown the correctness of his deductions. After devising the polygraph he was the first to establish the relationship between arterial pulse and jugular phenomena which is now well-recognized. He found in normal tracings what he called the A., C. and V waves; in complete irregularity (regularis perpetuus) he noted there was no A wave and concluded this was lost in the C wave. While A, B and V waves were shown in normal tracings, in complete irregularity the tracing showed only C and V waves and these were irregular in appearance as to time and also in amplitude. After many analyses he concluded that the A and C waves were superimposed. In his first work on the subject he called this the "nodal rhythm." He thought the A wave from beginning auricular activity, and the C wave from beginning ventricular activity, came together so to speak, because of the junction of the auricle and ventricle, and that the "line of fire" was in both directions at one time. Therefore, he referred to this phenomena as the "nodal rhythm." While he long since withdrew his statement, it is mentioned to show his process of reasoning.

From the standpoint of pathology in those cases where there was great irregularity, no two successive beats being exactly alike, he concluded that the auricle was paralyzed and ventricular activity (C and V waves) only was shown on the tracing, the A wave being entirely absent. That was the next step in his process of reasoning. Pathologists, however, claimed that could not be true because autopsy showed hypertrophy of the auricle.

*An extemporaneous address delivered before the Jefferson County Medical Society. Illustrated by numerous slides.

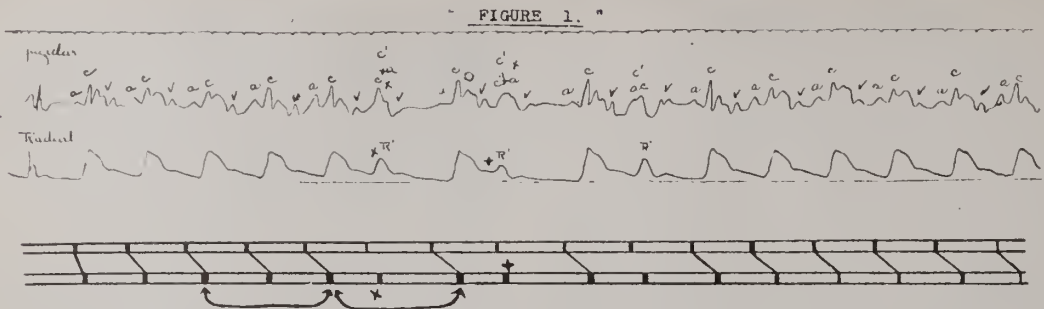


FIGURE 1. Simultaneous tracings of jugular and radial curves showing ventricular premature systoles (C' C' r' r') —The pause following is compensatory and due to the failure of the stimulus from auricle to provoke a ventricular contraction, the ventricle being in a refractory stage subsequent upon a premature contraction.

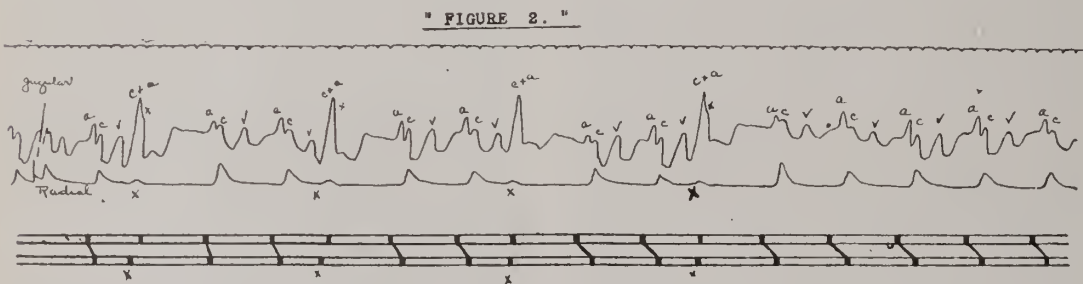


FIGURE 2. Polygram showing typical premature ventricular systoles. In figure No. 2 it will be observed that where the premature beat shows in the radial pulse we have a corresponding large wave in the jugular. The "C" wave here precedes the "A" wave and the "A" falls in with the "C" wave as demonstrated at the point marked "X" in the jugular tracing where it has developed a shoulder on the declining stroke. The reason for this shoulder not being evident in all the large "C"—"A" waves is due to the fact that we have slight changes in the time between auricular contraction. Clinical history of N—Case with results of four dental operations.

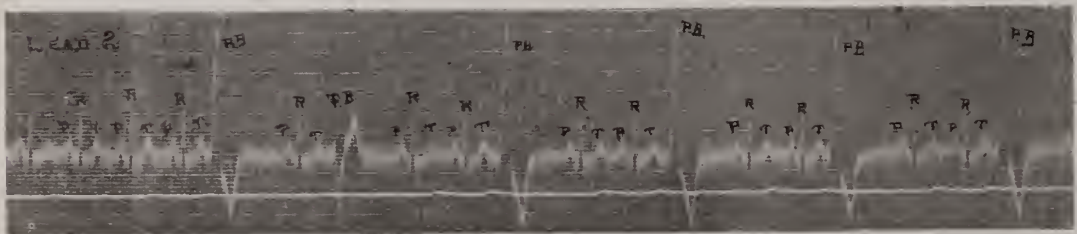


FIGURE 3. Electrocardiogram Lead No. 2—premature beats arising in right ventricle—(P. B.). With removal of foci about roots of infected teeth this irregularity disappeared completely. The complex (P. B.) is ectopic in origin and premature, the auricular event "P" being embedded in the complex of the premature ventricular beat.

" FIGURE 4. "

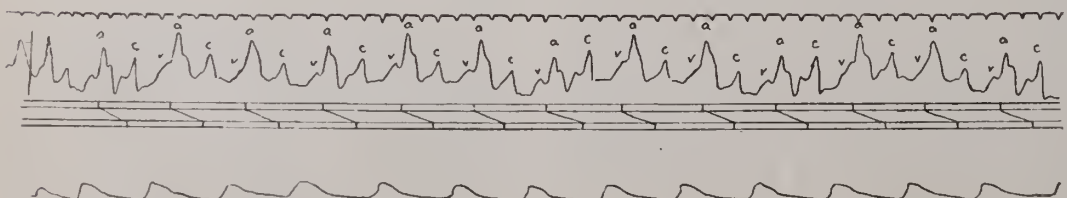


FIGURE 4. Polygram—showing prolongation of conduction time—"A-C" interval of over two-fifths second. This is the earliest stage of heart block—a delay in impulse passage from auricle to ventricle. Tracings.

ing exactly what it meant were right in their deduction that the phenomena represented a "mitral pulse" the end-result of long-standing mitral stenosis or regurgitation. In obstruction or regurgitation at the mitral orifice there occurs a "damming back" of blood in the right auricle which causes considerable disturbance and damage. There is usually complete cardiac irregularity, but this is not always true. Every physician of average experience has probably seen patients with hyperthyroidosis who developed marked cardiac disturbance which later entirely disappeared. Whether this result accrued from treatment or arrest of the existing toxemia is not known, but in any event the heart action returned to the normal type.

I desire to next direct attention to some of the clinical aspects of premature auricular and ventricular systole, and to insure adequate understanding of this phase of the subject it will be necessary to briefly review certain facts relating to the newer physiology of the cardiac apparatus. At the junction of the superior vena cava with the right auricle there is a node of specialized tissue, known as the Keith-Flack or sinus node, in which normal stimuli of heart contractions originate; it is from this point that stimuli originate causing the normal heart to pulsate regularly 72 times per minute. These stimuli or electrical forces are transmitted to the wall of the auricle as a result of which the auricular musculature contracts. That produces on the electrocardiogram what is known as the P wave, and in the polygram the A wave. The duration of time for passage of the stimulus from the sinus node through the His bundle and distribution to the ventricular musculature is one-fifth of a second. This is known as the normal conduction time, the A-C interval on the polygram, and P-R interval on the electrocardiogram. It is well to bear these observations in mind. It may be well to state, however, that the stimulus does not pass directly from the sinus node to the His bundle, there is a so-called "relay-station" known as the auriculo-ventricular node or the node of Tawara from which the impulse is transmitted to the His bundle. This bundle divides into a right and left branch and is then distributed to the papillary muscles finally finding its way into the Purkinje fibers and the subendocardial tissues. Just how the stimulus or so-called electrical force is produced, resulting in the cardiac impulses described, remains unknown; but the passage of the impulses can be traced through the His bundle to the ventricular musculature, and graphically recorded by means of the electrocardiograph.

I will not discuss the structure of these various nodes except to say they are composed

of neuro-muscular tissue. We know that in the dog the right vagus nerve sends branches to the upper node, and the left vagus sends branches to the lower node, and it is presumed the conditions in the human being are not dissimilar in any essential respect. The physiology of the cardiac mechanism has been carefully studied by several competent observers, the lower animals being used for the purpose of experimentation, and it has been demonstrated that the sinus node originates the stimulus which causes ventricular contraction. In other words, other nodes and the His bundle are subservient to the sinus node. However, in the human being occasionally the sinus node for some reason or other seems to be subservient to one of the other nodes.

While stimuli originating in the sinus node are distributed through the His bundle to the ventricle in one-fifth of a second, it must not be forgotten that the auricle may be stimulated by contraction of any part of the auricular wall, and the ventricle may likewise be stimulated by any part of the ventricular wall. In that way may be explained the production of premature auricular and ventricular systoles.

An interesting case occurs to me while speaking of premature ventricular systole. Four years ago a Cincinnati physician referred to me a man about 45 who had an enlarged heart, evidence of mitral regurgitation, and in addition marked cardiac irregularity. An electrocardiographic tracing of this case will be shown later. The patient gave the history of repeated attacks of "rheumatism" with gradual development of cardiac irregularity, dilatation, mitral regurgitation, etc. Under these circumstances what would be more natural than for the physician to conclude that he had myocardial disease, or that chronic degeneration of the cardiac musculature might be responsible for the symptoms? However, my tracing showed the type of irregularity in this case was due to premature ventricular systole. The practical point I wish to emphasize is the imperative necessity of recognizing premature ventricular systole because in ninety-five cases out of one hundred it is a functional disturbance. I said to the physician in this case that while the patient might have an enlarged heart and chronic mitral murmur, as he also had premature ventricular systole, I believe the disturbance might be due to toxemia and careful investigation should be made to try and locate a possible focus of infection, that it had been my observation and experience that this type of cardiac irregularity often occurred independently of organic disease. In this particular individual examination revealed several badly diseased teeth. These were extracted and in a com-

paratively short time the cardiac symptoms completely disappeared. The patient was greatly relieved of anxiety when informed that he had no organic heart disease, that the disturbances were purely functional. After removal of the cause the heart became normal as to rhythm, auricular and ventricular contractions, and conduction time. The size of the organ also returned practically to normal limits. The details of this case were published by the physician in the Ohio State Medical Journal. It seems that about two years after I had treated the patient some of the symptoms recurred and other diseased teeth were found, and following their removal cardiac rhythm again became normal.

The foregoing case is mentioned to emphasize the fact that this is a type of cardiac irregularity which can often be recognized without the employment of graphic methods. The physician should be able in ninety-nine out of one hundred instances to determine whether or not he is dealing with premature systole by feeling the radial pulse and listening to the cardiac pulsations. Most frequently there is a wide variation in rhythm which can hardly be overlooked, occasionally it may be so slight that it can with difficulty be recognized by the palpating finger, but if the stethoscope be used at the same time the irregularity can be easily detected. There is usually a delay equivalent to the duration of two normal beats which has given rise to the erroneous impression that in premature ventricular systole one beat "drops out" entirely. The term "dropped beat," when used in this connection is a misnomer. If the physician listens carefully to the heart he will note one beat follows another too quickly and there is then an abnormal period of rest. In other words, auricular stimuli have failed to excite contraction of the ventricular musculature. These features are easily distinguished on the polygraphic and electrocardiographic tracings.

I want to modify one statement for fear it may create an erroneous impression. I stated that premature ventricular systole practically always meant a function disturbance. I want to withdraw that because it is possible to have the production of this phenomenon associated with organic disease of the cardiac musculature. Disturbance in either the sinus node or the node of Tawara may also give rise to premature ventricular systole. These features will be more fully demonstrated by study of the polygraphic and electrocardiographic tracings.

Certain auricular disturbances will be further discussed while the associations of sinus node and auricular contractions are still fresh

in our memory. I have already spoken of auricular fibrillation in which the sinus node is inactive and stimuli are transmitted to the ventricle from the auricular wall. I shall show on the screen presently a physiologic tracing of a medical friend whose normal pulse rate is 44 to 48 per minute. There is simply a long interval between cardiac pulsations which is normal for that particular individual. He has remained in splendid physical condition for years without the least cardiac disturbance. The slow pulse rate was discovered when he was a medical student in Cincinnati over twenty years ago, but it was then unknown except in a general way why the pulse rate was slow. Now we possess a more comprehensive understanding of cardiac physiology and pathology and are able to explain such phenomena.

I shall show on the screen some interesting tracings from a case of long-standing mitral stenosis in which impulses are being transmitted by both the sinus node and the auricular walls, thus producing a combination of disturbed sinus rhythm and premature auricular systole. Accurate diagnosis in such a condition may entail considerable difficulty without the aid of graphic records.

In children the pulse rate is oftentimes normally irregular. This has been inaccurately called the respiratory type of cardiac irregularity. Not infrequently children are referred to us with suspected heart lesions because the pulse is irregular, and the question is asked can such children be safely given anesthetics for tonsillectomy, etc. Typical sinus arrhythmia in childhood may be considered physiological instead of pathological, the cardiac musculature responding to stimuli in the normal manner although the pulsations are irregular. One such tracing will be shown for the purpose of comparative study. Anesthetics may be administered to children having this type of cardiac irregularity with perfect safety.

An infrequent observation is abnormal auricular functioning known as auricular flutter. About three years ago there came under my care an old lady with heart block who was also the subject of a large uterine myofibroma. Her radial pulse was 144 and perfectly regular, and so far as could be determined this corresponded with the apex beat. The auricle was beating twice as rapidly as the ventricle, the electrocardiogram showing 288 auricular contractions per minute. Such irregularities cannot be successfully studied and analyzed without using the polygraph or electrocardiograph. I have a tracing of this case.

An interesting question arises in this con-

nection, i.e., what effect might be expected from the administration of digitalis in such a case? I hope this feature will be discussed, but I have the answer in the electrocardiogram which will be shown later. I wish to state that digitalis caused a decided aggravation of the cardiac irregularity in this case. Instead of the ventricular rate remaining at the rate of 144 per minute after three days it decreased to approximately 108, but to my great surprise the auricular contractions continued at the rate of 288 or the same number as before the use of digitalis. With ventricular contractions of 144 and auricular contractions of 288 there was a functional heart block of two to one; in other words, every second auricular impulse passed through the His bundle and caused contraction of the ventricle. Now, what happened after the administration of digitalis? The auricular contractions continued at the same rate, but the ventricular contractions were reduced to 108, thus instead of a two to one block it was first two to one, then three to one, and finally four to one. Digitalis evidently acted on the His bundle either through the vagus or the neuromuscular tissue, but it had no effect whatever upon the auricle which continued to beat with the same rapidity as before, thus increasing the irregularity. The impulses were blocked with greater frequency than before and an occasional ventricular beat was entirely lost. The patient became decidedly less comfortable under treatment than she had been previously. Digitalis was discontinued and she has since remained fairly comfortable regardless of the auricular flutter.

Probably every physician has encountered cases of paroxysmal tachycardia, where from a normal rate of 72 to 80 the heart suddenly begins to beat very rapidly, and just as quickly returns to normal. There is practically always auricular flutter in this type of irregularity, i.e., every stimulus, or perhaps every other stimulus, passes through the His bundle. Tracings of some of these cases will be shown.

I wish those of you who are interested in the therapy of cardiac lesions would think seriously of the action of digitalis in some of these cases. For instance, how foolish it would have been in the case of premature ventricular systole reported to give digitalis. This drug has been known to produce premature ventricular systole. When cardiac disturbances are due to toxemia why add another poison to the body? It is more rational to locate and remove the cause of the disturbance.

The practical features concerning cardiac physiology and pathology have been emphasized in a very positive way by the study of

graphic methods. In the majority of instances paroxysmal tachycardia accompanied by auricular flutter owes its origin to toxic material circulating in the body. Such cases are frequently noted in association with thyroid gland affections, in toxemia from gastroenteric and other systemic disturbances, etc.

In the further distribution of specialized cardiac tissue other more or less characteristic disturbances occur. One of the least frequent of these is known as sinus block, i.e., where instead of the sinus node originating and transmitting impulses for some undetermined reason refuses to functionate, and of course there occurs no contraction of the ventricle. Fortunately, this type of heart block is so rare that it is seldom observed.

The irregularity known as His bundle block occurs with comparative frequency. Such a case came under my observation a short time ago in which there was partial block, i.e., some of the auricular impulses passed through the His bundle in normal conduction time and caused ventricular contraction, at other times auricular contraction existed no ventricular response, thus producing partial heart block. It must be remembered that there always exists a decided tendency to the development of complete heart block where partial block has become established. The ventricle may at first respond normally to every second or third auricular contraction, then later there may be no response and complete block ensues. This is a most dangerous stage of heart block, the transitional period between partial and complete block. Involvement of the His bundle fibers continues to progress and interrupt transmission of impulses and when they are reduced to about 32 per minute it is called idioventricular rhythm; but before that point is reached the patient may suddenly die. As a rule long before the idioventricular rhythm is established the patient succumbs.

With reference to the type of heart block frequently noted in acute infections. Some of the tracings to be shown represent cases of partial or complete heart block which developed during so-called rheumatism or associated with acute tonsillitis. In one case instead of the conduction period being one-fifth of a second, it was prolonged to two-fifths of a second, showing marked delay in transmission of the impulse from the upper to the lower heart chamber. In another case with temporary disturbance of conduction the administration of digitalis produced true block; and this could be induced or caused to disappear with the administration or withdrawal of digitalis. This observation further emphasizes the important fact that in patients with irregular or slow heart action one should be very

careful about the administration of digitalis. In partial block with prolongation of conduction beyond the normal period digitalis may produce further prolongation and thus convert partial into complete block. This is known as digitalis heart block. Digitalis is a drug which should not be given indiscriminately.

The observation may be worthy of note that in cases of partial or complete His bundle block which have come to autopsy practically one-fourth were shown to have been due to syphilis. However, it may be due to various other causative factors. I have seen a calcified lymph node so situated as to interfere with function of the His bundle to such an extent that the patient had complete heart block with a pulse of 32 per minute. Partial or temporary heart block has also been noted as a complication of various other infectious diseases.

I will shortly show on the screen a tracing of a very unusual combination, viz., coincidental auricular flutter and heart block. I have not seen this mentioned in text books and Mackenzie says it is very rare. The patient was a man admitted to the Cincinnati Hospital with partial heart block and delayed conduction time with an occasional "dropping out" of the ventricular response. At one of my visits this man showed the most terrible jugular pulsations that I have ever seen. I was fortunate in obtaining a polygraphic tracing at the time which showed that the patient not only had partial heart block but also typical auricular flutter. In auricular flutter the entire auricular musculature contracts in unison, whereas in auricular fibrillation only certain fibers are in a state of contraction. There is a decided difference between the two manifestations.

The information afforded by recent electrocardiographic and polygraphic studies has enabled competent observers to distinguish the various types of heart block with greater certainty than heretofore. For example, it is now possible to determine whether His bundle block involves the right or the left branch of this bundle. Still more recently an attempt has been made to determine whether the neuro-muscular tissue and the so-called Purkinje fibers participate in the pathology. This is a moot question, however, which need not be further discussed at this time.

I shall now illustrate some of the conditions described by showing tracings on the screen.

HYDATIDIFORM MOLE; REPORT OF CASE*

By

E. L. HENDERSON and J. GARLAND SHERRILL,
Louisville.

Mrs. H., age 23, married, occupation housewife, weight 135, family history negative. Patient has had usual diseases of childhood, and no other illness. Began menstruating at age of 12. Has always been normal, and free from pain. Has been married three years. Has had one baby, 20 months old, which I delivered. The pregnancy, delivery and convalescence were normal.

Present trouble began about February 4, 1919, when she missed her menstrual period. She began flowing two weeks later, which appeared to be same as menstrual flow at first. The flow continued and at times there was a spurt of bright red blood and at other times she passed large clots with considerable pain, which led her to consult a physician, in Lexington where she was living at that time. Later, coming to Louisville, she consulted two or three physicians, all making a diagnosis of placenta previa. Patient first seen by me on June 5, 1919, giving the above history. Patient was put to bed and kept absolutely quiet for two weeks. During which time she was seen by Dr. Sidney Myers, in consultation with me. We were able to map out the uterus, which was enlarged to the extent of about three or four months pregnancy. While we suspected the patient had a placenta previa, we refrained from making a positive diagnosis. After finding that keeping the patient quiet in bed with some slight medication, had no effect on the bleeding, she was allowed to be up and about her room.

On July 5, I was called by her husband who told me that his wife was having considerable pain and was bleeding freer than usual. I called to see her at once and found that she was going to abort. I packed her and removed her to the Norton Infirmary, where I removed the pack, at which time the bleeding was so profuse I had her sent to the operating room. She was anesthetized by one of the nurses, as the doctor whom I had called to give the anesthetic had not arrived and she was bleeding so freely that I thought it unwise to wait any longer. At which time I delivered hydatidiform mole, which I present.

Mrs. K., age 23 years, mother of one child four years of age. Came under observation December 1, 1919.

*Read before the Jefferson County Medical Society.

Family history negative. Personal history: At age of 16 she was injured in a basketball game and had an operation for retroversion of the uterus and chronic appendicitis. The appendix was removed and the round-ligaments shortened by the Todd Gilliam method. She has never had any menstrual irregularity or pain except when pregnant. On July 17, 1919, she missed her period but felt fine. In August, 1919, she began to have morning sickness which has been constant ever since. She has lost considerable flesh as the result of being unable to take food without rejecting it. About two months ago she felt a sudden gush of clear fluid from the uterus saturating two napkins; no blood passed at that time. Subsequently, there was a slight gray discharge which was followed by a bloody flow. This was almost continuous with but few intermissions. Her attendant and a consultant saw her and concluded that it was an abnormal pregnancy because of the nausea, vomiting and discharge. Her pulse reached 140 and because of the repeated hemorrhage these gentlemen thought labor should be induced and passed a catheter into the uterus, meeting no resistance whatever. Beyond slight pain which followed the application there was no result. A specialist saw her one week later and advised that pregnancy be allowed to continue. When I first saw her she was passing some blood and very few clots, having no pain but persistent nausea.

Examination: A somewhat emaciated young woman, showing anemia, lungs normal, heart normal, but pulse rapid, abdomen presented a palpable mass in the hypogastrium centrally situated about the size of four and one-half month pregnancy. Foetal heart sounds not heard but this was scarcely expected. Vaginal examination showed a slight discharge from the cervix, brownish in color, without odor. The cervix was velvety and slightly patent to about one-half inch. The cervix proper was elongated and apparently elevated. There was a very slight fulness in the left fornix, the right fornix was filled with soft mass, apparently connected with the uterus, at least not distinctly separated from it. The uterine body seemed enlarged and very soft. At one examination I thought I could make out a small uterine body, separable from the soft, elastic mass and thought very likely we were dealing with tubal gestation, but a subsequent examination changed my opinion. The uterine body was found to compose the large portion of the intra-abdominal mass.

It was not very movable, probably because of the previous operation. Under anesthetic, a uterine dressing forceps was passed readily into the uterine cavity without meeting resist-

ance. An effort was made to dilate the cervix with the view of cleaning out the uterus, but the cervix was slow in dilating and this was abandoned, because I had determined it would be necessary to open the abdomen in any event. On section two, multilocular cysts were found, each about two and one-half by three and one-half inches in diameter. The uterus was somewhat firmly fixed in the pelvis probably because of the shortening of the ligaments. Subsequently it was freed and lifted from the pelvic cavity. It was soft but contracted after a time from the manipulation. Both the ovarian cysts were removed. The question was debated whether it was safer to empty the uterus by incision through the uterus itself or to close the abdomen and deliver the contents from the uterus. I decided it was safer for the patient and easier for the surgeon to empty the uterus through the incision. Therefore, hysterotomy was done and the hydatiform mole, the result of a missed pregnancy, was removed. The mole was separated with difficulty from the mucosa. The hydatiform mass would about fill a quart cup. The interesting features connected with this case are the fact that none of the hydatiform mass escaped from the uterus which would have made the diagnosis easy. There were two features, however, outstanding which seemed to be important signs of missed pregnancy or mole, namely: the discharge of a large amount of clear fluid and the soft semi-fluxuant feel of the uterus with only slight effort at contraction and the absence of foetal heart sounds. Pre-operative diagnosis: abnormal pregnancy, possible hydatidiform mole, and pernicious vomiting.

Effect of Pepsin Fomentations on Cicatricial Keloids.—Frieboes reports from the Rostock dermatologic clinic his experiences with the pepsin method of treating keloids. He experimented with from 1 to 3 per cent pepsin solutions, both hot and cold, and with and without hydrochloric acid. The results, after treatment extending over weeks and months, were excellent. He found there is no advantage in solutions stronger than 1 per cent; also that it does not matter whether the solution is hot or cold, and that the addition of hydrochloric acid has no particular value. Frieboes recommends this prescription: pepsin, 1 gm.; boric acid, 3 gm.; water, enough for 100 gm. Application was made usually only at night, but occasionally both day and night. Cicatricial keloids as thick as the little finger, resulting from severe burns, disappeared completely after three months' treatment, so that only a soft, scarcely noticeable atrophic scar remained. He has found the pepsin treatment valuable also in treating patients with keloid from lumps.

THE VALUE OF BLOOD UREA DETERMINATION IN MEDICAL AND SURGICAL CASES*

By MARGARET S. GRANT, Berea.

We are living in a time of vastly improved diagnostic and prognostic methods. Research workers are constantly improving old methods and discovering new aids to diagnosis and prognosis. Especially to be noted are the various excretion tests, namely the qualitative and quantitative examination of the urine for urea, ammonia, glucose, acetone, diacetic acid, and the renal function test of Roundtree and Geraghty. More recent workers have emphasized the value of retention tests, such as the examination of the blood for sugar, total nitrogen, urea, uric acid and creatinine.

All are familiar with the ordinary urinalysis made as preliminary to an operation. In addition to this, especially if some part of the genito-urinary tract is to be operated on, the Roundtree-Geraghty kidney function test is commonly made, with a view to determining whether the kidneys are in shape to stand the strain of the anesthetic and the operation. The test consists of injecting into the muscle or vein exactly 1 c.c. of a solution of phenol-sulphonephthalein, equivalent to 6 mgms. of the dye, and estimating by colorimetric methods, the per cent of the dye excreted in the urine within a certain time. It is usually considered that there should be an excretion of at least 30-40 per cent for the first two hours after the injection to indicate safety in operation; an output below 20 per cent for the first hour is a decided indication to wait for more favorable conditions.

This test is valuable and should have its place. As Gradwohl and Blavais say, "It is an excellent method of estimating the kidney function for the moment, but it does not represent the condition of the kidneys so far as retention of objectionable constituents is concerned, over a long enough period of time to accurately weigh body metabolic changes." Gettler favors the Geraghty tests as of value in diagnosing the degree of impairment in surgical kidney (abscess of kidney, tuberculosis of the kidney, stone etc.), but maintains that this test alone would not be sufficient to determine operative safety. The test is particularly useful when it is desirable to ascertain unilateral kidney function; or in cardio-renal cases to determine in how far the condition is the result of impaired kidney function.

However, in certain cases we can obtain

no reliable information by the use of the Geraghty, the phthalein elimination being influenced by cardiac decompensation and other unknown factors, so that quite unexpected results occur in individual cases. Also large amounts of bile and blood in the urine make the reading of the test impossible. Again, in cases of voluntary urination and in some types of obstruction not all of the urine can be collected.

The retention tests on the other hand are not open to any such objections. Instead of simply indicating the elimination alone of certain substances, they indicate their retention, or the difference between the amount produced in the tissues and the amount eliminated as Frothingham points out. Goldstein states, "In suppression of urine and its subsequent conditions, uremia, we have two conditions which may be recognized sooner by a series of blood urea determinations than by any other test, simply on account of its being a retention test. On several occasions an oncoming uremia was diagnosed in this way long before the information was obtained by excretory tests," and Folin and Denis corroborate this by saying that "We may find large amounts of blood urea with no evidence of kidney disturbance."

The urea in the body tissues is derived mainly from ingested proteid substances, and an accumulation of urea in the tissues is indicated by a corresponding increase of urea in the blood. The normal urea concentration varies from 20 to 40 mgms. per 100 c.c. of blood, or about 65 per cent of the total nitrogen content, according to Pillotson.

Van Slyke's method of using the whole blood is the method usually employed for determining the urea concentration. It is a relatively simple process, the test taking about two hours, from the preparatory steps through to the final calculations. A definite amount of blood is obtained, before breakfast for uniform results, and by the addition of urease, the urea is converted into ammonium carbonate, and from this the urea concentration can be readily calculated. As the urease attacks no other substance but the urea, the reaction is not interfered with by the presence of any other substance in the blood.

As stated by Frothingham and others, in general the results of the Geraghty and the blood urea tests parallel each other, an increase in blood urea concentration being accompanied by a decreased phthalein output, hence it is preferable to employ both tests, the one as a check on the other, rather than to depend on one alone. Goldstein also suggests the importance of making several sets of tests, before an operation especially; one

*Read before the Madison County Medical Society.

on admission of the patient, and another in from three to five days, to ascertain whether conditions are more or less favorable for operation. If the blood urea is increased on the second test a higher degree of toxicity is shown, and indicates the seriousness of the condition and the need of keeping the patient in bed and on a low proteid diet to reduce the toxicity.

As has been stated, the normal limits of blood urea concentration are from 20-40 mgms. per 100 c.c. of blood. An increase up to 75 mgms. is probably within safety limits as regards operative prognosis. Goldstein states that among his cases rarely did a patient recover from an operation with a urea concentration of over 100 mgms. Also, that in cases with a blood urea of between 75-100 mgms. the prognosis is better if there is a progressive decrease, but bad if there is a progressive increase. The prognosis too, is bad if the urea concentration fluctuates, better if it remains about stationary.

The determination of the urea concentration is of value also to the obstetrician, being, as Gettler says, "Of particular practical importance in the toxemias of pregnancy; especially in threatened eclampsia, where the blood picture indicates the course of treatment to be followed so as to clear the organism of those retention products. The blood picture," he goes on, "according to the amount of retention, practically always is a safe guide as to the speed with which the uterus is to be emptied, thereby eliminating the focus of toxic absorption. Very often this can be accomplished even before the onset of convulsions."

The history of a few surgical cases where both the Geraghty and blood urea tests were made may be of interest. All were cases of prostatic enlargement coming for operation.

Case 1: Mr. D., aged 63. On the day after admission the urea concentration was 151.2 mgms. The patient was kept in bed, and four days later the blood urea was 70.8 mgms., and the Geraghty 17.5 per cent the first hour and 11 per cent the second hour. A few days later a prostatectomy was done and the patient made a good recovery.

Case 2: Mr. C., age 59. On admission blood pressure was 160; blood urea 58.56 mgms. Geraghty, slight coloration for two hours. A week later the blood urea had increased to 112.56 mgms., and the Geraghty showed only a faint trace of coloration. Operation was judged to be too much of a risk, and the patient was sent home. The doctor writes us that two months after leaving the hospital the patient became seriously ill, developed coma and died four days later.

Case 3: Mr. H., age 69. Blood pressure on admission 154; temperature 102.2; blood urea the day after admission 123 mgms.; Geraghty 14 per cent for first hour and 25 per cent for second hour. Six days later, blood urea, 331.2 mgms.; Geraghty 10 per cent for first hour, and 15 per cent second hour. A week later the blood urea was 367.2. Uremic symptoms had been developing, and death of patient occurred a little less than three weeks after admission.

CONCLUSIONS:

1. The determination of the blood urea concentration then, being a simple and reliable test, should be more frequently employed by the profession.
2. It is valuable for diagnosis and prognosis in cases of nephritis.
3. In cardio-renal cases it may be used to determine whether the heart or the kidneys are more at fault.
4. It gives warning of the onset of toxemia in pregnancy, and is a guide to treatment.
5. In surgery, especially that involving the genito-urinary tract, it is an indication as to safety of operation.
6. It should be used in conjunction with the renal function test, and preferably at least two sets of tests should be made.

COMPLETE TRAUMATIC RUPTURE OF KIDNEY: REPORT OF CASE*

By STUART GRAVES AND J. A. CASPER
Louisville.

Although traumatic ruptures and lacerations of the kidney as the result of falls, contusions and sudden muscular strains are comparatively frequent, complete ruptures are not very common and the report of this case seems warranted because of its comparative rarity, its cause and its clinical course.

J. E. W., white, male, age 55. Admitted to surgical service of Louisville City Hospital at 11:45 A. M., on July 19, 1919. Died same day at 7:35 P. M. Provisional diagnosis: scalp wound, sprained back. Final diagnosis: ruptured kidney. History obtained from landlady with whom patient roomed was as follows:

On returning home late previous evening in an intoxicated condition patient had ascended front stairs to second floor and apparently had intended to turn to left into a small hall leading from main hall to his room. Opening from main hall in same direction and separated from other hall only by a par-

*Presented before the Muldraugh Hill Medical Society.

tition was another flight of back stairs leading downward. These back stairs were divided into two parts with a landing in middle, upper portion consisting of ten steps. On landing in middle was a wooden doll bed about 2X3 feet, 18 inches high, with a sharp-edged board across its foot. Patient when picked up about ten minutes after his fall was lying face downward with his right side over foot of this doll bed, his arm and head pointing toward lower half of back stairs and his feet on second step of upper half of same stairs. He was conscious, but unable to rise by himself. After being picked up he complained of pain in his back and right side and soon fainted. He was aroused in a few minutes and during the night complained of pain and drank much water. In morning he was weaker, but refused to summon a physician. Late in forenoon ambulance was called.

On admission patient was so restless that his temperature could not be taken. At noon his pulse was 100 and respirations 40. He could not urinate and a small amount of bloody urine was obtained by catheterization. Patient was evidently in shock and was given one-fourth grain morphine sulphate hypodermically and supplied with external heat. At 3:30 his temperature (axillary) was 96.4. His pulse was so weak it could not be obtained. His respirations were 48. Physical examination showed dullness and marked tenderness over right loin at level of the third and fourth lumbar vertebrae. There was general tenderness over his abdomen. No fluid in abdomen detected. At 6 P. M. chart notes state he had had intense thirst since the accident and had been extremely restless. Died 7:35 P. M.

Autopsy four hours, post-mortem. A 19-30. Restricted by coroner to determination of cause of death. Notes essential to this case follow:

Over the right parietal region, about 15 mm. from median line and posterior, is an inverted "U-shaped" laceration in skin of scalp. Flap of skin is separated from subcutaneous tissue and covered with dark, dried blood along the edges of laceration, evidently a traumatic wound. No fracture of skull evident. No blood present in ears or mouth. Dried blood present in right nostril and at tip of nose. Sclerae of eyes pale and clear. Conjunctivae pale. Pupils regular, equal, 4 mm. in diameter. Arcus senilis present. Mucous membrane of mouth very pale. Chest shows no fractured ribs, but a depressed, colorless, oblique streak, 8 cm. long, is present over seventh, eighth and ninth ribs, not breaking through skin. Upper end of streak is 10 cm., lower end 9 one-half cm. to right, of median line. No other signs of injury present.

Peritoneal cavity. On cutting through peritoneum about 100 c.c. of blood stained fluid escaped from lower portion of abdominal cavity. Intestines are forced downward into pelvis by a large retro-peritoneal mass in region of right kidney. No blood clots present in pelvis. Distal and posterior to inferior surface of liver and mesentery and distal to stomach a bluish mass is apparent. This mass presses anteriorly against inferior surface of liver and is apparently deep to mesocolon on right side. On separating liver from mass and pushing colon and jejunum to one side, it is found to be retro-peritoneal, 9 by 11 by 13 cm. in diameter. When peritoneum is sectioned mass appears to be a firm clot of blood. On cutting into this clot, semifluid, extravasated blood is found, in center of which two rather firm masses are palpated. When removed these two masses prove to be separated halves of right kidney. Blood is found in ureter.

Right Kidney. Weight, 250 gms. Upper half connected with renal artery. Broken surface covered with firm blood clot about 3 cm. thick. Lower half connected with ureter and vein. Ureter is filled with clotted blood for half the distance to bladder. One-fourth of broken surface is covered with freshly clotted blood. Remainder shows ragged surface oblique from posterior to anterior surface and straight across from lateral to medial border. Kidney surface is smooth and reddish gray with easily stripped capsule. Cut surface normal. Cortex 7 mm. thick. Left kidney negative.

Bladder. Contains small amount of bloody urine. Mucosa normal. Wall uninjured. Organ collapsed. No fractures of adjacent bones.

Anatomical Diagnosis: Complete transverse rupture of right kidney, retroperitoneal hematoma, hematuria, secondary anemia, body bruise, scalp wound.

The literature contains fairly numerous references to traumatic lesions of the kidneys, besides those due to stabs or bullet wounds. Two of the most comprehensive articles are by Keen (1) and Watson (2). Keen tabulates 155 cases of which thirteen only were similar to the one herein reported in that the kidneys were completely fractured or divided as the result of falls or crushes which did not produce external penetrating injuries. Watson's article is largely analytical. He divides the accidents, according to their nature, into muscular action alone, such as lifting or catching heavy objects, and into blows upon the front of the abdomen. Perirenal hematomata occur very soon after injury. Increase in the size of the hematoma does not necessarily im-

ply dangerous hemorrhage provided it does not occur rapidly or continue too long.

Watson quotes Kuster as stating that "the only theory which satisfactorily explains lacerations of the kidney after non-penetrating wounds is that of hydraulic pressure acting through the full vessels and pelvis and causing the organ to burst along lines, for the most part radiating from the hilus toward the point of maximum impact of the lower ribs, the opposing resistance being supplied by the vertebral column. Experiments performed with flaccid kidneys thrown with some force upon the floor showed that only superficial laceration was thus produced. On the other hand, when the pelvis and arteries were injected and ligatured after closure of the vein and the organ thrown down, there ensued deep laceration of the kidney substance."

Perirenal hematoma may occur as the result of laceration of the parenchyma of the kidney or rupture of the renal vessels. It may also be produced by rupture of vessels within perinephritic fat tissue. Hematoma may occur behind or under the kidney and may reach great size. Blood may escape into the renal pelvis and, if obstruction to the outlet occurs as the result of thrombus formation, this portion of the kidney may become greatly distended. Sometimes hemorrhage will be intraperitoneal as the result of laceration of the peritoneum over the organ. Aneurisms of renal vessels may occur as the result of injury to them, and much blood may be lost in this manner.

Causes of death may be said to be shock and hemorrhage, either peri- or intra-renal or into the ureter, although anuria as the result of injury to the kidney must also be considered. On this point Keen says, "Unfortunately, whether by reflex or other cause, when only one kidney is injured, occasionally the other kidney ceases to act and anuria results, just as if both kidneys had been originally injured, and is apt to be fatal." Extravasation of urine into the peritoneal cavity, with subsequent infection, while it may cause death, does not do so so readily as hemorrhage and shock.

If the patient in our case had been brought to the hospital promptly and quickly operated his life might have been saved. If tumor in one side of the abdomen and hematuria are observed in connection with a history of trauma such as this, a diagnosis of ruptured kidney may be considered probable. If operation is resorted to at this point fatal hemorrhage or subsequent infection may be prevented.

REFERENCES:

1. Keen: *Annals of Surgery*, 1896, XXIV., 138.
2. Watson: *Boston M. & S. J.*, 1903, CXL., 29 and 64.

HYPERTROPHIC PYLORIC STENOSIS: OPERATION: RECOVERY: CASE REPORT*

By GAVIN FULTON, Louisville.

The subject of this report is a child eight week old who was admitted to the hospital for operation under the diagnosis of pyloric stenosis. The patient was not markedly emaciated and had commenced to vomit only a week before. Food did not seem to be assimilated and vomiting occurred immediately after eating or within an hour. Alvine evacuations were irregular, but had not ceased to occur. On the fourth day, according to the history, the vomiting became projectile in type. Dr. P. F. Barbour saw the child about that time and made the diagnosis of pyloric stenosis.

At my first visit emaciation was slight regardless of the vomiting and consequent lack of nourishment, and peristaltic waves were distinctly noted. No abdominal tumor could be detected on palpation, and there was little rigidity of the abdominal musculature. Inasmuch as no tumor could be discovered, and that feces were being discharged from time to time, in spite of the vomiting and evident pyloric spasm, we thought it wise to delay surgical intervention for the time being, watching the child carefully and weighing it at frequent intervals.

Within thirty-six hours the child had lost nearly two ounces in weight, vomiting had become more persistent, the abdomen became distended, and celiotomy was performed (forty hours later) by Dr. Guy C. Grigsby. The operative findings verified in every particular the diagnosis previously made by Dr. Barbour. The child was returned to bed in good condition. No vomiting occurred after the operation and the patient will probably make a satisfactory recovery.

Investigation of the literature shows that one of the principal points in the differential diagnosis between pylorospasm and hypertrophic pyloric stenosis is that in the latter there is generally complete fecal obstruction which is untrue in the former, and the decision to operate is based upon this single differential point. In this case the child was

*Clinical Report before the Louisville Medico-Chirurgical Society.

passing feces, yet hypertrophic pyloric stenosis was undoubtedly present. I mention this as a feature of particular interest.

The roentgen-ray examination was negative, except that after seven hours the stomach still contained some of the barium mixture.

DISCUSSION:

J. Garland Sherrill: I saw the patient mentioned by Dr. Fulton through the courtesy of Dr. Grigsby, and at that time there was noted a very perceptible peristaltic wave. To my mind it was a rather typical case of hypertrophic pyloric stenosis. I have operated upon only one case of this type, and was fortunate enough to save the life of the baby. A Rammstedt operation was performed, which is very simple, and consists in making a free incision through the pyloric muscularis without disturbing the mucosa and then stretching the muscular tissue by the insertion of forceps. In the earlier operations it was thought necessary to accurately close the incision by approximating the muscle, thus making a diamond-shaped affair after enlarging the pyloric lumen, but this was not found of any particular advantage. Better results seem to have been secured by simply incising the thickened pyloric walls downward to the mucosa, then inserting forceps in the submucosal space and stretching the pyloric lumen beyond the point of incision. This plan of treatment has afforded more favorable results than gastroenterostomy. Downes, of New York, has probably done more work along this line than anyone else in this country. It was formerly believed that hypertrophic pyloric stenosis, but in recent years gastroenterostomy was indicated in all cases of hypertrophic pyloric stenosis, but in recent years better results have been obtained by the simple operation of Rammstedt. It is remarkable how rapidly these children improve after the operation.

The stenosis in these cases is not due to muscular spasm; there is a contraction of the muscular tissue, or failure of the muscle to develop; the pylorus is hard and fibrous in character, the thickness of the wall being three-eighths of an inch or more.

Delay is often dangerous in cases of this kind, and if the patient does not respond promptly to the administration of belladonna, even if there is some alvine discharge from the rectum, it is safer to proceed with the operation. There is often only a partial stenosis in these cases, the pylorus being just sufficiently obstructed to allow accumulation of food in the stomach which ferments thus causing vomiting with consequent emaciation from lack of nourishment.

The symptoms rarely begin before the fifth or sixth week of life when persistent vomiting and progressive emaciation direct attention to

the fact that there is something wrong with the gastroenteric tract.

Henry Enos Tuley: Cases of the character reported by Dr. Fulton are not very common and are always interesting. I believe he acted wisely in delaying operative intervention until the cause of the trouble could be accurately determined.

The pathology is a true hypertrophy of the pylorus, there being a great increase in muscular tissue, which may continue for several weeks before complete obstruction is produced. In the interim small quantities of food gravitate through the pylorus into the intestine and fecal discharges continue.

My impression has been that gastroenterostomy offered better results than the Rammstedt operation, and I am surprised to hear that the latter is now the accepted procedure.

I had under observation at the Louisville City Hospital recently a rather interesting case of intestinal obstruction with fecal vomiting. The patient was operated upon and a large omental cyst found and removed. This cyst had caused total obstruction of the lumen of the small intestine and fecal vomiting. Such cases are of great interest because they are unusual.

Philip F. Barbour: In the case reported by Dr. Fulton I had the privilege of seeing the patient several days before operation, and at that time examination disclosed a tumor in the pyloric region. I have seen a great many cases of hypertrophic pyloric stenosis in infants, some of which were relieved by surgical measures, others were not operated upon and also recovered. In some cases the pathology is not a true mechanical stenosis. In one case particularly which I recall the roentgen-ray showed that the gastric contents passed through the pylorus, and in that case complete relief was obtained by feeding the child skimmed breast milk. The mother had an abundance of milk which was withdrawn from the breast and the cream separated. The skimmed milk was given to the child and from that time on there was no further trouble.

I think it is always wise in these cases to try antispasmodic treatment before resorting to surgical methods. For this purpose I prefer atropine administered at frequent intervals for three or four days, and if this does not relax the pylorus then operation is indicated. *Veratrum viride* has been recommended as an antispasmodic in these cases, but personally I prefer atropine administered in maximum doses.

Gavin Fulton, closing: Referring to the statement made by Dr. Barbour: I could discover no pyloric tumor before operation in the case reported, nor could Dr. Grigsby; but Dr. Barbour's diagnosis of pyloric stenosis was verified by the operation. There was a pyloric tumor but it

was behind the border of the liver, there was a true hypertrophic pyloric stenosis, yet fecal discharges had not entirely ceased at the time operation was performed.

ONE OF THE SEQUELAE OF INFLUENZA: CASE REPORT*

By JOHN J. MOREN, Louisville.

I have here a little girl aged 7 years, who gives the history of having had influenza some time last winter, and the condition which she shows now is an aftermath of that. She was admitted to the hospital the first time last spring. At that time she was unable to sleep and when put to bed cried almost continuously. After being dismissed she went home and later was sent to the juvenile court for some reason. She was then brought to the hospital for further observation.

She now presents a typical picture of paralysis agitans, the right side being involved to a greater extent than the left. There is practically no tremor so long as she remains quiet, but on attempting to walk typical symptoms of paralysis agitans are noted. She is sleeping very well now and has not recently been bothered very much with night terrors. She has for some time suffered from marked salivation, the saliva it will be observed, is running from her mouth constantly.

One thing that was suggested to me when this child first came under observation was that I had seen similar pictures during an attack of encephalitis lethargica. I believe she at one time had double vision. Her pupils now react normally to light and accommodation and the diplopia has disappeared. There is some weakness of the knee reflex on the left and elbow on the right side. There is no nystagmus and the child is not nearly so idiotic as she appears. She answers questions promptly and intelligently.

About three weeks ago a little girl was sent to me for examination. She then had a temperature of 100 degrees F. and had been lethargic. I suspected it was a case of encephalitis. I did not know what else it could be. I happened to have some tablets of creosote and calcium and thought I might as well try them. In a week she was well. This week she has taken her examination at the Girls' High School. The child before you has also taken calcium. Iron, arsenic and strychnine have likewise been given. She has improved but whether this is due to the medication or the general care she has been getting in the

hospital, including cold baths, etc., I do not know.

Altogether, I have seen about thirty cases of encephalitis lethargica and not a single one of them has made what I consider a complete recovery. One patient I thought made an excellent recovery, but her mother states that she is not entirely well.

DISCUSSION:

W. E. Gardner: It seems that the sequelae of encephalitis lethargica are proving much more serious than we thought they would be two years ago. Patients who have recovered so far as life is concerned have not remained well from a neurological standpoint. Many of them have developed partial paralysis primarily, or manifestations similar to paralysis agitans, sometimes myoclonic twitchings.

I saw several encephalitis cases in Chicago last summer. One I recall especially was a man 21 years of age who had had typical manifestations of the disease. He subsequently developed tremor of the body and hands quite typical of ordinary paralysis agitans. Another patient had myoclonic twitchings of various parts of the body. The sequelae of encephalitis mark it as a very grave disease.

S. G. Dabney: I was under the impression that in encephalitis lethargica the following three distinct paralysis of the eye muscles, usually the symptoms were nearly always present: (a) a adducens, (b) severe headache, and (c) fever. These three symptoms are noted in the acute attack. The little girl exhibited by Dr. Moren does not appear to have had any of these manifestations according to his report.

The opinion I have expressed is based upon the few cases that I have seen. In every case the symptoms I have mentioned have been noted. So far as I am aware all the patients have recovered without after-effects. I did not know that sequelae were common following encephalitis and would be glad if Dr. Moren would tell us something more about the matter in closing.

J. R. Peabody: I saw a case two weeks ago showing effects of encephalitis which impressed me as being very unusual. I was requested to examine a boy of 17 and report on the condition of his eyes. He gave the history that in February, 1919, he became suddenly ill while at work in a drugstore and was taken home. He had high fever and in a short while became unconscious. Prior to that time he had been in perfect health.

The remainder of the history was obtained from the physician who treated him. Several physicians had been called in consultation as the case was very puzzling, but from the history it was undoubtedly one of encephalitis. I was told that this boy was unconscious for three months, that he could be aroused sufficiently to take nourish-

*Clinical report with exhibition of patient before the Louisville Medico-Chirurgical Society.

ment, but showed no evidence of consciousness otherwise.

The curious feature is now at this stage he has some eye symptoms; his right eye is drawn upward and outward, although he has no double vision now and does not recall that he has at any time seen double. His hearing is perfect, his reflexes are greatly exaggerated, he is in a very similar condition to the little girl exhibited by Dr. Moren. The manner in which he carries his left arm impresses one that he must be the subject of paralysis, but this is not the case.

His mental condition has been interesting to me. To see this boy walking along the street with his head drawn to one side and one eye drawn upward, he would be considered an idiot, or certainly that his mentality was very poor, yet when spoken to he answers questions promptly and intelligently. The man who formerly employed him in the drugstore told me that the boy could come into the store now and call the names of different drugs, combinations of the various extracts, etc.—the boy was learning to be a drug clerk when taken ill.

A most interesting feature is the prognosis in cases of this kind. This boy has shown gradual improvement and is able to walk about every day. He is now being treated, I understand, by one of the chiropractors in the city.

Another interesting feature is that the family physician does not believe the boy had encephalitis, he insists that the boy's condition is the after-effect of typhoid fever. There were no symptoms of cerebro-spinal meningitis in this case, although this was considered in the beginning. Spinal puncture was made and the fluid proved to be negative.

I thought it might be interesting to call attention to this case in connection with the sequelæ of encephalitis. The initial attack occurred nearly two years ago.

John J. Moren, closing: I was fortunate in being able to attend a two-day discussion of encephalitis last month and it was very interesting. I found that nearly all of the men who discussed the subject practically agreed as to the present situation in encephalitis, i.e., they regard it as a separate and distinct entity, something new, and that it is entirely different from poliomyelitis. One man who reported on the pathology found that all of the cases which had been studied fully corresponded, that they had the same pathological picture, a characteristic round-cell perivascular infiltration, usually at the base of the brain and especially about the ganglia. However, the disease does not always confine itself to the basal ganglia, in many cases it seems to localize about the nuclei of the third nerve especially. If it does not localize about the third nerve or the basal ganglia the patient will not have double vision. The brunt of the attack may

be spent on the cerebellum and cerebellar symptoms be noted. It may be spent on other portions of the brain or the spinal cord with the production of symptoms characteristic of these regions. The so-called myoclonic type is not uncommon.

I saw last winter three cases of the myoclonic type and in neither case did the patient have double vision, but they had typical individual muscular contractions. I mention this to show how widely the symptoms vary. I believe it is stated that between fifty and seventy per cent of the patients have diplopia, but not all of them.

During the past winter I saw a patient with Dr. Frazier in which the principal symptom of encephalitis was delirium. When delirium occurs in these cases it is not as deep as one might expect considering the amount of cerebral involvement. This man had very little elevation of temperature.

So far as the prognosis is concerned: Dr. Peabody has just described the picture better than I can. I have seen three or four patients, aged 16 or 17, with the after-effects of encephalitis similar to the one Dr. Peabody described. They looked like idiots, still in talking to them it was evident they are not mentally weak, but they have changed in personality. I have under my observation one boy who has epileptic seizures not typically epileptic in character but they are convulsive seizures. I recall one boy who is hemiplegic in type. Another was sent to me by his father for examination to determine the cause of his constant expectoration. He was spitting all the time because of the accumulation of saliva.

I do not know what kind of a prognosis to give to these people, in fact I do not believe anybody knows; but I have not seen a case yet that has made what I call a complete recovery.

In the discussion I have mentioned one man reported eighty-nine cases he had examined during the autumn, the patients having had encephalitis anywhere from six months to two years previously. Ten per cent showed some chronic progressive condition following the disease. Some of them showed the Parkinsonian syndrome exhibited by the little girl who has been before you. He said the remainder recovered. When asked how many of these patients were absolutely well he replied "very few."

An interesting feature to me was that in over eight hundred reported cases two per cent were doctors.

True and False Stomach Disease.—Zayas classifies the various types of stomach disease, and sets in a group apart the cases in which there are symptoms from the stomach owing to loss of balance in the abdomen, or to disease of the nervous system or liver, or to syphilis or anemia.

INVAGINATION OF ILEUM: RESECTION: RECOVERY: CASE REPORT*

By J. GARLAND SHERRILL, Louisville.

A child, aged 6 years, was referred to me for examination because of a tumor-mass in the right abdominal quadrant. The patient had complained of abdominal pain, and at various times, according to the history, some mucus but no blood had been noted in the alvine evacuations during the last few days. I readily made the diagnosis of intestinal invagination and advised immediate operation.

I had previously seen several cases of intussusception, having operated in three such cases, in each of which the situation was exceedingly grave. I had learned from experience that it was unwise to resort to extensive manipulation in an effort to reduce the invagination, because it is usually hopeless.

In this case there was not much abdominal distension, the child was in fair condition, and was seen within a few hours after onset of the symptoms of invagination. The abdomen was incised and I rapidly resected the invaginated portion of the ileum which was near but did not involve the caecum coli.

After completing the resection it was noted that a section of the intestine beyond the line of suture seemed darker than normal—it was not black but of a deeper reddish-purple color than normal—and further resection was considered; but it was finally decided that the time necessary for additional resection might jeopardize the chance of the patient's recovery. The color of the intestine improved under hot sponging, the operation was quickly completed, the abdomen was closed without drainage, and the patient was returned to bed in good condition.

When the dressing was changed at the end of seven days a small gas cyst was found under the skin along the incision; in other words, there was some swelling of the abdominal wall and when puncture was made the gas escaped, followed in a short time by the discharge of feces. The remarkable thing is that this condition of affairs had evidently existed for a week, and yet the patient has exhibited no indicative symptoms. The child improved rapidly and was allowed to go home with the fistula still discharging. The operation was performed several months ago. The patient has now returned to the Children's Hospital and I have been requested to make an effort to close the opening in the abdominal wall. I have been hoping that within six

months the opening might close of itself as this has happened in numerous similar instances. However, it has not done so and the advisability of further operative steps must be considered. The physical condition of the child has markedly improved and he would probably be able to successfully withstand further operation.

The mortality is very high following surgery for intestinal invagination. This is the fourth case I have operated upon with seventy-five per cent mortality. This patient is now well except for the presence of the fecal fistula.

PRESENT METHODS IN THE TREATMENT OF FRACTURES*

By J. GARLAND SHERRILL, Louisville.

The advent of roentgenology has produced a marked change in the management of fractures, as compared with the methods formerly employed. Before this means of accurate localization and definition of the lines of a fracture was accessible, one was forced to be content with the knowledge obtained by inspection, digital examination, measurement and certain characteristic deformities, in the determination of the presence and character of a fracture. In fractures near a joint it was in many cases impossible to more than approximate the exact condition presenting.

During this period surgeons became quite proficient in the application of existing knowledge in the treatment of these injuries, and good functional results, with a minimum of deformity, were obtained in a large percentage of cases treated. It was not unusual for some deformity, perhaps of minor degree to occur, which was considered as immaterial, provided good function resulted. In fracture of the long bones, particularly of the femur, a certain amount of deformity was considered to be the inevitable result, and if this shortening was kept within reasonable limits, the outcome was considered to be good.

At this time, which was before the development of aseptic surgery, compound fractures were looked upon as exceedingly serious injuries, and in many instances amputation was done early to save life where it would not be considered at present.

Open operations were employed in the treatment of fractures during this period, only to provide drainage in infected fractures, and to stimulate repair in cases of delayed and non-union. Notwithstanding the handicaps under which the surgeons of those days work-

*Clinical report before the Louisville Medico-Chirurgical Society.

*Read before the Jefferson County Medical Society.

ed, one can but admire the ingenuity they employed and the results they obtained.

Now, however, we have reached a new era, one in which the definite outline of the injury to the bone can be clearly established, making accurate replacement by manipulation a possibility in many cases. The exactness of alignment of the fragments may be determined by skiagram after replacement, and if proper adjustment fails of accomplishment by manipulation, the surgeon has access to the open method of treatment.

The conclusion is not justifiable that because the open operation in competent hands has proven safe it should be employed in every instance. A sufficient number of accidents, in competent hands, have been reported to show that in order to obtain first-class results this method of treatment should be employed only when the indication is clear, and by surgeons whose technic approximates perfection. Such operations should be done in well-equipped hospitals.

The established indications to be met in the treatment of fractures are:

1. Accurate approximation of fragments.
2. Proper alignment of limb.
3. Proper fixation.
4. Careful employment of bandages, to prevent constriction.
5. Rest to the injured part.
6. Restoration of function in the joints, musculature and nerves of the limb.

To meet the first of these indications it may be necessary to employ only the simplest manipulation, but if there is any difficulty in obtaining satisfactory adjustment, the replacement should be made under anesthesia. In all the manipulations necessary to bring the fragments into position the attendant should remember that excessive or violent efforts at reduction tend to increase swelling, to produce excessive callus formation and may result in damage to the main vessel of the limb. In instances of fracture of the long bones, particularly of the lower extremity, before any manipulation is made the surgeon should assure himself of the condition of the circulation distal to the fracture.

Proper alignment of the limb is necessary to obtain a cosmetic result, to assure good function after recovery. In the upper extremity the carrying function is of great importance, and its proper re-establishment should constantly be borne in mind. It is very important to retain flexion and extension of the joint, particularly of the elbow, and also to apply the dressings in fractures of both bones of the forearm so there will be no encroach-

ment upon the interosseous space, and no fusion of the bones. The space between the two bones is greatest in the position half way between pronation and supination, with the thumb upward and the palm toward the chest.

In the lower extremity, there is a tendency to posterior sagging at the middle of the leg in fractures of the tibia and fibula, which must always receive consideration. If union is allowed to occur in this position there is interference with function at the ankle which is to some extent disabling and productive of muscular tire and pain. The weight-bearing surface of the ankle should be placed at right angles to the limb in order to fully retain its weight bearing power and customary function. Even the slightest change in this relationship may at times produce disabling strain, necessitating special shoes or other appliances for correction, which are troublesome and unsatisfactory.

To obtain proper alignment of fragments, especially in muscular individuals, due attention should be paid to the effects of muscular contraction upon the fragments. In most cases this contraction may be overcome by placing the limb in such position that the muscles will be relaxed allowing the fragments to come into apposition. This action is most noticeable in the thigh. The action of the psoas and iliacus results in the marked anterior tilting of the upper fragment in fracture at the upper third, there is usually external rotation of this fragment, while the adductors pull the lower fragment upward and inward behind the upper fragment. This deformity is increased when the periosteum is torn entirely across. If this remains intact, it prevents to some extent the deformity and aids in proper efforts at replacement.

At the lower extremity of the femur, the pull of the gastrocnemius causes posterior displacement of the lower fragment, while the muscles of the thigh cause great overlapping of the fragments. Hence, in such cases a direct pull in the axis of the limb fails entirely to correct the displacement. Flexion of the limb, with, in some instances, traction from the knee, will usually obtain proper adjustment of the broken bone. Where there is still difficulty in obtaining a correct alignment, tenotomy becomes very useful, and in my opinion, is not employed as often as it should be.

Correct fixation is a *sine-qua-non* in the prompt and complete restoration of function. The late war has demonstrated the great value of the Thomas splint, or some of its modifications, particularly that of Col. Keller, in the primary dressing and handling of cases of

fractures of the thigh and leg, as well as in some fractures of the arm. Its great advantage lies in the fact that it is the most available dressing for transport and it is particularly useful in open fractures where access to the wound is desirable. In cases where the alignment is satisfactory this method may be employed throughout the treatment, and the patient is usually very comfortable in this apparatus suspended from a Balkan frame, but often it will be necessary to substitute a secondary dressing of suitable kind. No ambulance service should be without this kind of splint. In the definitive treatment of a fracture to obtain prompt healing both joints adjacent to the injury should be immobilized.

It is scarcely necessary before this audience to emphasize the necessity for the careful adjustment of the bandages to produce equable pressure throughout, without constriction of the limb. If the bandage is too loose, the patient complains of pain from muscular spasm while if it is too tight he has pain or discomfort from pressure, and there is always the possibility of ischaemia and gangrene. Allowance should always be made for swelling. The position of the injured limb should be checked within the first few days so that correction may be made if necessary.

Restoration of function in the limb is the desideratum. How it will be accomplished will depend very greatly upon the character of the injury, but much more upon the judgment and experience of the surgeon. One of the first questions for decision will be, how long shall the first dressing remain? If the alignment is satisfactory, and the patient comfortable, it may remain a week or even ten days. In most cases it is wise to inspect the injured limb at this time even when the alignment is satisfactory. Usually the dressings are becoming loosened from the subsidence of the swelling, and need readjustment. At this time also minor adjustment may be made, and massage of the muscle commenced, which will do much to hasten absorption of the exudate, and to relieve later muscular stiffness. In my experience, motion of the joints at this time, without exciting pain, is of advantage. If the motion is painful, it is good evidence that it is contraindicated.

Subsequent change of dressing should be made from time to time, as indicated, in order to massage the limb, and obtain muscular movements and restoration of joint function. When the leg and thigh are in plaster the changes are made infrequently.

Up to this point my remarks have been directed to the simpler forms of fracture, and those capable of ready re-adjustment. Your attention will next be directed to the open

method of treatment, which is of recent development.

Dr. John B. Roberts considered the open treatment of fractures in a monograph published in 1899. Halsted and Sir Arbuthnot Lane also have made valuable contributions to the subject, while Albee has placed the bone graft within easy access to all, and H. H. Grant with a modification of Allen's gimlets has contributed in no small way to the facility with which the open treatment may be successfully employed.

To my mind there are certain well fixed indications for operative intervention in fractures, and there are a few fractures where the open operation should be the rule.

The indications for open operation in recent fractures are:

Compound fractures of the skull, for drainage etc; fracture of the patella, simple or compound, since no other method gives such a prompt recovery or so good a functional result. In simple fracture, the operation is best done three or four days after the injury.

All compound fractures, where infection seems likely, and particularly in war injuries. Compound fractures resulting from indirect violence do not, as a rule, demand intervention.

Fracture-dislocation of the humerus.

All closed fractures where carefully attempted replacement under an anesthetic cannot be accomplished. I am aware that this allows very broad latitude to the attendant, and that a replacement which in some hands would be difficult or impossible, in the care of others might be quite readily made. Oblique fractures, and those with the interposition of periosteum, muscle or fascia, particularly in the thigh often demand open operation.

Fractures complicated by damage to the main artery or nerve of the limb.

In addition to these indications for the open method in the treatment of recent fractures, there are certain conditions that require open operation later in the course of treatment, or after treatment has been completed, as:

Malposition, when there is probability of improvement of the deformity, or of function.

Persistent neuralgia from the incorporation of a nerve in the cicatrix.

Delayed or non-union.

Open operation has some advantages over the closed method of treatment even in simple fractures of the long bones, in that approximation can be made more accurately, thus resulting in smaller callus formation, and less

impairment of muscular function. To counterbalance this, however, there are two facts for consideration; one is the possibility of infection, which though unlikely does and will occur, the other is the demonstrable fact that any foreign substance, placed in contact with a broken bone, does tend to delay union. But where the clear indication exists, these two facts should not deter the surgeon from the open method.

To consider briefly the indications above:

There can be no argument concerning the first postulate, that all compound fractures of the skull should be explored, if for no other reason than to provide drainage, and to prevent infection. Some surgeons may not agree with the view expressed concerning fractures of the patella, but I feel sure that those with experience in the use of both plans of treatment will agree with my contention that the open method is far superior.

There is likely to be more debate concerning the method of operation upon these cases, and some still resort to the use of wire and other complicated methods of approximation. When one grasps the fact that the patella is in reality a portion of the quadriceps muscle and that this tendon is torn at the same time the bone is broken, he can readily understand that all that is necessary to hold the bone in position is to coapt the tendon, and such indeed, is the fact. For years I have used chromic catgut to bring the edges of the torn tendon together and found the bone to fall nicely into position, the tendon being sutured over the bone as well as laterally. The results have been uniformly satisfactory. The joint, of course, should be freed of clots prior to suture. The removal of the clots does away with the troublesome adhesions which so frequently follow treatment by the expectant method. Similar treatment may be employed in fracture of the olecranon.

In infected compound fractures, the wound should be thoroughly exposed, and all foreign material, loose bone, blood clots removed, drainage should be provided, if necessary, by counter openings. Fragments of bone, sufficiently attached to insure proper nutrition, should be retained, and due regard given to the future usefulness of the limb. I feel sure that during the war the debridement in some of these cases was excessive, because the effect of infection in these injuries were so disastrous. In civil life, however, there is not the same grave danger to life or of prolonged suppuration that is ever present before the military surgeon, hence one may more safely retain these bone fragments which are still attached.

A most important question in these cases

is that of irrigation with normal saline or antiseptic solutions after the wound is dressed. Here, too, the treatment is likely to differ in civil from military injuries. It seems to me that when these cases do not have to be transported, they do better with free drainage and the simplest form of dressing. There is a certain resistance in the tissues which takes care of the small bacterial invasion better without than with irrigation. When under the observation of the same surgeon from day to day any evidence of infection permits immediate and thorough opening of the wound, and it is remarkable how few cases demand such intervention.

War fractures, because of the almost certainty of bacterial invasion, the loss of blood, the long exposure before the first debridement and thorough cleansing is accomplished, are exceedingly liable to infection. This, coupled with the fact that the patient is not under the control of the surgeon, renders it likely that some form of drain and irrigation will be necessary.

Fracture-dislocation demands some form of treatment which will insure reposition of the head of the bone with the least trauma, and at the same time provide the proper replacement of the fragments. The best means at hand for the accomplishment of these indications, is the employment of Grant's modification of the Allen gimlets.

Whenever a closed fracture is impossible of replacement under anesthesia, either from the interposition of muscle, fascia, or periosteum; because of the obliquity of fragments, muscular contraction, or other cause, open operation is necessary.

With rupture of the main vessel, or damage to one or more of the important nerves of the limb, a complete inspection of the injury is necessary, with a view to suture of the vessel or nerve, to ligature of the vessel or to amputation, if the injury demands it.

I desire to call your attention briefly to some of the methods provided for the fixation of fragments by the open method, and also to emphasize the necessity for the most scrupulous care in handling these cases to prevent infection. The hands must be kept out of the wound, the bones held by strong forceps, and all dissection of the tissues be made with tissue forceps and knife or scissors.

There are a number of materials at hand for the approximation of broken bones: Catgut, kangaroo tendon, silver wire, bone plates, ivory pegs, bone inlay, detachable metal plates, steel nails, pins, etc. Parkhill's clamps, Allen's or Grant's gimlets. In addition Steinmann's pins, ice tongs etc., are employed to

produce extension in cases in which it is indicated.

In some fractures, as the patella, olecranon, or other of the smaller bones, a simple absorbable suture is often quite sufficient. In others, particularly those of the thigh, a stronger support is required. Mr. Lane believes that his plates are ideal for this purpose. These plates, made of the proper strength and size will hold the bone in place until union occurs. They have the following disadvantages:

1. A foreign body is left in the limb permanently, or it must be removed later.

2. There is some delay in healing because of its presence.

3. There is often developed a rarefactive osteitis at the site of attachment which may give trouble.

4. It is not suited to some comminuted types of fracture.

The bone inlay makes an ideal means of approximation in certain cases to which it is adaptable, but it is often necessary to make another operation upon the same patient to obtain the graft, and this is not always desirable. A sliding inlay including the periosteum works very well.

In my experience, the employment of some appliance which holds temporarily, and is easily removable, makes the best method of treating fractures.

Of all these appliances Grant's gimlets are the most universally useful, application is easy, fixation is perfect, infection unlikely and removal is accomplished readily and painlessly, and there is little or no interference with repair.

For purposes of obtaining traction, when indicated, adhesive plaster, or Sinclair's glue are most valuable. In certain instances, where the injury is near the knee or ankle, and these simpler measures are not satisfactory, the employment of ice tongs, nails, or of Steinman's pins is permissible.

The surgeon sees many cases of delayed union resulting from the presence of infection at the site of the fracture. There has been much discussion as to the propriety of attempting to plate, or fix the fragments, in the presence of infection. It seems to me that as a rule, to which there are, of course, exceptions, interference should be delayed until the infection has subsided. In some such cases, however, a thorough cleansing, and removal of detached and diseased bone will result in prompt and complete bony union. It would seem, therefore, that the determination of the time for intervention should be left to the discretion of the surgeon, who is usually able to determine pretty accurately

just what are the chances to overcome the infection.

DISCUSSION:

A. R. Bizot: The essayist said that all fractures of the olecranon process should be treated by the open method. In point of illustration: Mrs. H. fell and fractured the olecranon; the space between the process and fractured end of the ulna would easily admit the thickness of the index finger. With the aid of the x-ray the exact nature of the deformity was ascertained; the arm was put at complete extension; a gauze pad adjusted and retained in its natural position as verified by the x-ray; this position was maintained for five days when a slightly flexed position with the adhesive as before was begun; every other day the flexion was increased until complete flexion was attained; the end result was complete union with no deformity and no impairment of function whatsoever at the end of nine weeks. This as well as several others treated in the same manner lead me to believe that discretion should be practiced in the management of fractures of the olecranon. We should not lose sight of the ravages of infection which might ensue following the open plan and especially so about a joint.

It has been stated or mention made of compound fractures to be of trivial concern where the bone barely penetrated the skin. An unfortunate case bearing on this point: E. B., aged five years, fell and fractured the ulna at the middle third, the end of the bone merely protruding through the skin. Iodine was applied; the wound liberally filled with iodine; the fracture reduced; 1500 units of antitetanic serum administered. The next day the x-ray revealed a perfect alignment of the bone; yet, "sâd but so" in eighty-three hours the little patient was dead, a victim of tetany. I cannot but help believing the open method with free drainage the method of choice in compound fractures.

Guy P. Grigsby: In the treatment of compound fractures the surgeon should always bear in mind the possibility of gas bacillus infection. The protruding bone may have come into contact with the ground, and dirt or even grass may carry the gas bacillus with resulting gas infection. We saw a great many such cases in military practice.

In civil practice compound fractures, where there is a possibility that the wound has been contaminated by dirt or grass, should be treated just the same as war wounds. In not a few instances gas gangrene has developed necessitating subsequent amputation as a life-saving measure.

Before entering army service I had the misfortune to see two cases of gas bacillus infection following compound fractures. The first case

was a man who sustained a fracture of the tibia which had perforated the skin and subsequently when it was drawn into the soft tissues carried with it some grass which was unsuspected at the time. The wound was opened superficially and drainage instituted. That man promptly developed gas bacillus infection necessitating amputation and we succeeded in saving his life.

In the second case a man had a compound fracture of the femur followed by gas bacillus infection. The wound was thoroughly opened and drained, removing considerable disintegrated tissue, and infection was controlled by using chlorazene irrigations. He made a satisfactory recovery.

In every case of compound fracture where even a suspicion exists that the wound has been contaminated with dirt or grass, the surgeon should always suspect gas bacillus infection. I know of nothing which will cause more regret than to have such a patient apparently do well for twenty-four to forty-eight hours then develop gas bacillus infection; in the majority of instances in spite of everything that can be done the patient will die. Fatality may be prevented as a rule by making a free opening for drainage, dissecting out traumatized tissue and using Carrel-Dakin irrigations.

Frank T. Fort: Compound fractures should always be treated by making a large counter-opening wherever possible to secure proper drainage. I recall the case of a man who sustained a fracture of several ribs and a compound fracture of the humerus. He had a wound on one side of the arm and I made a counter-opening on the other. Several large blood clots were extruded through this drainage opening, and the man recovered. In another case a man had a compound fracture of the femur. A counter-opening was made, through-and-through drainage established, and he made a good recovery. Another man had a compound fracture of the tibia the protruding bone being driven into dirt and cinders. I excised about one and a half inches of the tibia and made a counter-opening on the opposite side for drainage. This man recovered without limp.

In compound fractures if the surgeon will make a counter-opening and establish free drainage the danger of gas bacillus infection will be thus eliminated. In all cases of this kind a prophylactic dose of anti-tetanic serum should be administered. I have never encountered a case of gas bacillus infection in civil practice.

Babcock has recently recommended chloride of zinc solution to overcome deep infection in compound fractures preparatory to bone insert or plating. I have had no experience with this method but good results are reported.

I agree with Dr. Sherrill relative to the treatment of fractures of the olecranon process and

patella. We should wait three or four days (eight days would probably be better) then perform open operation and fasten the fragments together by means of absorbable material, being careful to always remove the flange of fascia usually found interposed between the fragments. Unless this is done there is little likelihood of securing bony union. In fractures of the olecranon and patella treated by adhesive plaster fibrous and not bony union is usually secured. I saw Sir Arbuthnot Lane plate a fracture of the olecranon process before the American Congress of Surgeons, in London, in 1914. He had great difficulty in applying the plate, and I believe his only reason for doing so was to show us that it could be done.

There is no operation the surgeon is called upon to perform which requires greater skill than bone plating. For a while nearly everyone was trying to plate fractures, and as a result amputation became necessary in many instances. In selected cases, under the strictest asepsis and careful aseptic technique, bone plating will be productive of excellent results. Not every fracture should be plated, and each case should be considered as a separate and distinct entity.

In the entire domain of surgical practice there is no place where mechanics and mechanical ideas are more essential than in the treatment of fractured bones.

W. Barnett Owen: There are three essential points in the treatment of all fractures: (a) reduction of the fracture, (b) maintenance of reduction, and (c) restoration of function. The method by which these results may be best accomplished will depend largely upon the individual surgeon. The plan with which he is most familiar, and which has produced the best results in his hands, is the one he should follow. If reduction, maintenance and restoration of function can be secured by the closed method of course that should be employed.

In fractures of the olecranon, patella and certain oblique fractures of the femur in muscular adults, I would advise open operation as a routine procedure. Open operation is also indicated in most instances where fracture occurs in or near joints. Perfect reduction is more important in such cases than where fracture occurs away from joints, although, of course, complete reduction is hoped for in every case.

Surgeons as a rule have abandoned the practice of inserting non-absorbable material in bone just as they have in the soft tissues. For that reason mechanical devices, such as Grant's gimlets, for maintenance of reduction in fractures of the long bones have come into more general use, because by this method the surgeon has external control of internal conditions. The gimlets are easily removed without anesthesia or opening the wound secondarily.

After the fractured bone has been reduced and maintained in as perfect alignment as possible, in some cases deformity will occur in spite of everything one can do. When union and the best possible alignment have been secured, the next important item is restoration of function. That, unfortunately, has not received the attention it deserves. For instance, in Colles fracture, even with perfect union and alignment, the patient may have a stiff wrist. It has been my practice in such cases to remove the dressing once a week and institute massage and active motion just short of production of pain. This method is also applicable to other fractures in accessible situations.

In the treatment of all fractures we should pay greater attention to the circulation, the nerve supply, and restoration of function.

C. G. Forsee: I agree with what Dr. Grigsby has said about the treatment of compound fractures, i.e., radical surgery is indicated, particularly where it is feared contamination may have occurred.

The restoration of anatomic function is the ideal to which the surgeon should direct his attention in the treatment of fractures. Whether the injury occurs near the joint or elsewhere, the question to be decided is how much deformity can the patient be allowed and still have good anatomic function.

In the treatment of fractures of any type I am unalterably opposed to introduction into the tissues of metal appliances to maintain reduction of the fragments. I would rather take the chances on a fixed dressing, and with rare exceptions good anatomic function has been secured by this method, than to subject the patient to the danger of open operation and the insertion of metal plates.

I have heard all my professional life about the non-union of fractured bones. In my experience non-union has been a great rarity. Bone will usually unite if given sufficient time. As Dr. Owen has said, the cause of non-union in the majority of cases is constitutional disease, usually syphilis.

John B. Richardson, Jr.: While I concur with nearly everything Dr. Sherrill has said in his paper, there are one or two points on which we disagree. The question that the doctor brought up relative to treating the patient or the fracture when it is the neck of the femur is the point on which I cannot agree with him. My experience leads me to believe that the proper method here is to treat the fracture irrespective of the patient's age. In these old people the continual moving of the fragments as is always done when the bed is changed or they are placed on the bed pan produces pain and discomfort and finally does more to "wear them out" than if a well-fitting plaster of Paris cast is applied. Let me

say here that the application of a cast is a surgical procedure and a large amount of practice is necessary before it can be done as it should be.

It seems to me, as a general proposition, that the use of the roentgen-ray has made surgeons less expert in the diagnosis and treatment of fractures than they were twenty-five years ago. I also think the roentgen-ray has increased the application of the open operation in the treatment of fractures during the last six or eight years.

The pendulum is now gravitating backward toward its proper place, and open operation is being advocated less frequently than heretofore. We are making greater effort to reduce fractures and maintain fragments in proper apposition by the closed method, just as we did in years gone by, and this in my opinion is the proper method of treatment.

E. S. Allen: One of the essentials to good results in the treatment of fracture is correct anatomic apposition of the fragments. In certain cases reduction can be easily accomplished by simple measures, but fractures near joints, including Potts and Colles, should always be reduced under the fluoroscope. I have found this plan very satisfactory in many types of fracture. After reduction has been accomplished under the fluoroscope the usual dressing is applied, and roentgen-ray examination later will show whether or not perfect anatomic apposition has been maintained. The administration of nitrous oxide gas, where an anesthetic is demanded, has been found very satisfactory.

One should always be careful in applying plaster dressing on fractures of the forearm. If made sufficiently tight to prevent dislocation of the fracture, it is likely to produce myositis which will ultimately cause greater trouble than the original injury.

I have frequently found it necessary to resort to open operation in fracture of both bones of the forearm with over-riding. In attempting to keep the fragments in apposition by extension with weight and pulley, the ulna and radius are sometimes pulled so close together that cross union occurs with unsatisfactory results. In several cases of this type I have resorted to open operation and fixation by the gimlet method with good results, several fractures of the surgical neck of the humerus with over-riding have been similarly treated without infection and with perfect ultimate results. In some cases of this type extension by weight and pulley will also be productive of satisfactory results.

I. A. Arnold: Every fracture must be considered by itself, i.e., there are no set rules for the treatment of any type of fracture. After the diagnosis has been determined by roentgen-ray or fluoroscopic examination, the surgeon

should be able to decide at once whether to treat the case by closed or open methods. Unnecessary manipulations which increase the trauma should be avoided in handling fractured bones. Open operation when necessary should be performed promptly instead of waiting until repeated attempts have been made to effect reduction by the closed method. I do not advise operating on simple fractures where the fragments can be held in proper position by other means; but if they cannot be held in place by closed methods, then I do not hesitate to open the fracture site in any case and thus secure perfect apposition.

As to the time to operate on fractures: I do not agree with Dr. Sherrill that we should wait for three or four days. I make it a rule to operate if possible within the first six hours. If this cannot be done I prefer waiting at least twenty days until swelling has subsided and nature has come to our rescue. The best results have been secured by open operation immediately after the fracture has occurred. The material to be used for maintaining reduction after open operation will depend upon the site of fracture, the age and location of the patient, i.e., whether he is in the hospital or elsewhere.

All fractures of the femur and both bones of the forearm which cannot be otherwise held in perfect apposition should be treated by the open method. Fractures of the patella and the olecranon process should likewise be treated by open operation.

I disagree with those who believe that in the treatment of fractures more attention should be devoted to restoration of function than to position of the fragments. Good function cannot be secured without good position. Apparent function may be obtained even where there is considerable over-riding of the fragments, but as the position is faulty the patient will return later for correction of deformity which could have been prevented. Secondary operation is often required in such cases to overcome deformity and restore function.

As to Lane plates: These are all right if properly used, otherwise they are of little value. It is useless to apply a plate where soft tissues are interposed between the bone ends and expect to get union. The plate is intended merely to hold the fragments in apposition until union occurs. In fractures where there is a tendency to over-riding, if the Lane plate is properly applied position is maintained and union always occurs.

There are three causes for non-union: (a) constitutional disease, (b) mal-position, and (c) interposed soft tissues. There is no such thing as idiopathic non-union. It is important that the periosteum be in contact with the bone to prevent deposition of callus in adjacent muscle. Patients with fracture of the femur sometimes re-

cover with a stiff knee which seems to be ankylosed, but the cause of the trouble is usually a deposit of callus in the quadriceps muscle. When there is an inordinate amount of callus there is mal-position or displacement of periosteum.

In fractures near joints complete immobilization is necessary not only at the fracture site but also in the joint. Unless this is secured the tendon slipping over the joint will cause an exudation, and the more exudate, the more the callus; and the more callus the more trouble there is with the joint.

I oftentimes use wire for maintaining apposition of the fragments where there is a tendency to separation, as in fractures of the patella, where kangaroo tendon will not suffice. The best method of all is the sliding graft, but in some cases this cannot be used. In applying the sliding graft one must be sure to place periosteum to periosteum, compact bone to compact bone, and endosteum to endosteum, otherwise the result will be fibrous union. The medullary graft is especially advantageous in fracture of the femur where strength is required. In using the medullary graft the periosteum must be removed from portions entering the canal of the bone to prevent fibrous union. If there is an open space between the ends of the bone, of course the periosteum should be left on that portion of the graft.

As to the treatment of compound fractures: I agree with Drs. Grigsby and Forsee. If there is any place where radical surgery is necessary it is in the treatment of compound fractures. Sometimes, of course, radical surgery may be done where it is not needed. Free drainage must be established to overcome infection. I have used Lane plates quite often in the presence of suppuration and have been criticized for it, but good results were secured just the same.

Robert T. Pirtle: The discussion shows that we have all come to the same conclusion about the treatment of fractures, viz., that it makes little difference what method is used to maintain the fragments in apposition after reduction, so long as satisfactory ultimate results are secured. If this cannot be accomplished by the closed method, then the fracture should be properly reduced by open operation and the fragments held in place if necessary by an appropriate device.

In fracture of both bones of the forearm or even of the femur with the patient under a general anesthetic reduction is not always easy; in fact after the fracture site has been opened it is sometimes difficult to effect reduction with forceps, levers, etc.

The fragments may be held in apposition by means of silver wire, bronze wire, autogenous grafts, bone pegs, kangaroo tendon, etc., all these have a legitimate place in the treatment of fractures. I do not use metal plates of any kind;

they often produce rarefying osteitis and sometimes non-union.

In my experience fracture of the femur in either children or adults has been difficult to maintain in position; but now with the Hawley table and Grant's gimlets, less trouble is experienced. I do not know how we were able to handle such cases successfully before we had the Hawley table. This has simplified our work materially and has enabled us to secure much better results.

PERFORATED DUODENAL ULCER: CLOSURE: GASTROENTEROSTOMY: RECOVERY: CASE REPORT*

By L. WALLACE FRANK, Louisville.

The subject of this report is a man aged 38 years, who had been complaining of symptoms indicating some gastric disturbance for about six weeks. He came to us on account of sudden severe epigastric pain which had developed during the previous night.

Physical examination revealed the entire abdomen exceedingly rigid. Blood count showed an increase in leucocytes and in the percentage of polymorphonuclear cells. The temperature was 99.3 degrees F., pulse 100. The possibility was considered of a perforated gastric ulcer or perforated appendix. After carefully watching the patient for over an hour, the pulse in the meantime gradually increasing in rapidity, we decided that he had a perforated gastric ulcer and advised immediate operation.

Celiotomy disclosed a small perforated ulcer of the first portion of the duodenum with considerable exudate behind the liver and in the right iliac fossa. The man had first complained of greatest pain in the epigastrium and later in the right iliac fossa, and it was on that account the possibility of perforating appendicitis had occurred to us.

The duodenal perforation was closed, the pelvis drained by a stab wound, and a drain also inserted to the point of closure. The man recovered from the operation without an untoward symptom. Two weeks later a posterior gastroenterostomy was performed, from which he also made a satisfactory recovery, and has since remained well.

My reason for reporting this case is the method by which it was handled, viz., by the two-stage operation. Some authorities advise that gastroenterostomy and closure of the perforation be performed at the same time. In the opinion of others simple closure of the

perforation without gastroenterostomy is sufficient.

DISCUSSION:

Louis Frank: The foregoing report is incomplete in certain respects. The patient was sent to us with the diagnosis of acute appendicitis which we questioned at the time. Within two hours the liver dullness had entirely disappeared, the patient was able to lie on his abdomen, and inquiry revealed the history of so-called "indigestion" extending over a period of six weeks. We were certain then that there was a perforation high in the intestinal tract.

The reason for not doing an immediate posterior gastroenterostomy was that the pelvis was filled with fluid (especially behind the liver) and we considered it unsafe under the circumstances to open the posterior cavity and incur the danger of infection. Therefore, a stab wound was made for drainage and the posterior operation postponed until a later date.

It is believed by many authorities that simple closure of the perforation is sufficient in cases of this kind, but my own practice has been to perform posterior gastroenterostomy either at the primary operation or a short time subsequently. In this instance after duodenal closure had been made a small omental graft was placed over the opening. At the second operation it was noted that perfect healing of the graft had occurred.

At the primary operation the man's pelvis was filled with a dirty-looking fluid. Perforation had evidently occurred several hours after the ingestion of food. The acute pain began during the night and operation for closure was performed the following day.

In many cases of this kind a diagnosis of perforative appendicitis is likely unless careful inquiry is made into the history. The patient usually gives the history of sudden shock with severe pain gradually extending to the lower abdomen. This is characteristic of duodenal perforation. In appendicitis pain is first noted in the umbilical region and gradually becomes localized in the right iliac fossa. The pain occurring late in the right iliac fossa in duodenal perforation is due to leakage with gravitation of fluid into the fossa.

In all cases of duodenal perforation I believe gastroenterostomy should be performed. There is usually considerable scar tissue and induration about the site of perforation after closure which is likely to cause obstruction later. Cases have recently been reported where patients had to be subjected to secondary operation for obstructive symptoms several years after primary closure of duodenal perforations. One author states that secondary operation is nearly always

*Clinical Report before the Louisville Medico-Chirurgical Society

made necessary by recurrence of symptoms after primary closure of the perforation.

The mortality following gastroenterostomy under these circumstances should not be greater than one per cent.

J. Garland Sherrill: I have seen two cases of perforated duodenal ulcer in both of which the condition of the patient was such that I deemed it wise to make a simple closure of the perforation. However, like Dr. L. Frank, I am inclined to believe that sooner or later symptoms may recur and demand gastroenterostomy. In these two cases the patients disappeared from observation and I am not positive as to the final outcome, but both recovered promptly from the operation. I can readily understand that the ulcer might either persist and cause symptoms necessitating further operation, or the cicatrix contract to such extent that stenosis of the duodenum or pylorus might occur. Under these circumstances drainage by means of gastroenterostomy posterior is undoubtedly the best plan of treatment.

It is remarkable what nature will sometimes do to protect the patient with gastric ulcer, and I may be pardoned for mentioning a case coming under observation a number of years ago when this subject was not so well understood by the profession as at present. I was called to see a robust-looking man 45 years of age, who had been gradually losing flesh and gave a typical history of gastric ulcer. That was the diagnosis made and the man urged to submit to operation which he refused. Two years later I was again called and this time found the man in articulo mortis. Autopsy disclosed an ulcer three inches in diameter in the posterior wall of the stomach covered only by a thin layer of peritoneum which had finally ruptured with the result stated. It seems remarkable that the patient could live with a gastric ulcer three inches in diameter without rupture for that length of time.

This case is mentioned particularly to emphasize the danger of gastric lavage where symptoms of ulcer have persisted for a long time. Fatal rupture of the ulcer has been known to occur under such circumstances. However, in early gastric ulcer lavage is usually without danger and often distinctly advantageous.

Louis Frank: I have seen a number of cases of chronic gastric ulcer where perforation has occurred. Perforation in the greater cavity especially may be occluded by intestinal adhesions or become fixed to the abdominal wall and thus cause no trouble for a long time. We have under observation now a man who has been complaining of gastric symptoms for several years. I believe he has a chronic perforating ulcer and we expect to operate upon him tomorrow.

I recently saw a patient with chronic ulcer which had perforated and the stomach had be-

come attached to the pancreas. This case emphasizes the point Dr. Sherrill has just made. Then man was in the hospital for quite a while and refused operation. His symptoms became alarming and we finally did a trans-gastric operation; an enormous gastric ulcer was found which had ruptured and become attached to the pancreas. The ulcer area was resected and the stomach closed by direct suture. The patient was almost moribund when operated upon but made an excellent recovery. He has some distortion of the stomach but has had no further symptoms.

As a rule immediate operation is indicated in all duodenal perforations. However, I recall one patient who came under observation with acute symptoms and operation was delayed for several days. The symptoms in the meantime subsided evidently because the site of perforation had become "walled off." Operation was later performed and the patient made a satisfactory recovery. As a general proposition delay is dangerous in cases of this kind, and the plan followed in this particular case is not to be recommended. I have seen cases where the symptoms subsided and a few hours later secondary perforation or further extension occurred with prompt lethal exit of the patient.

L. W. Frank, closing: The point made by Dr. Sherrill about the danger of gastric lavage in ulcer cases should be emphasized. I recall the case of a man who was known to have a chronic gastric ulcer, but his physician thought it safe to practice gastric lavage. After leaving the doctor's office the patient had a severe abdominal pain and was sent to the hospital. Operation revealed a large indurated ulcer in the posterior wall of the stomach in the center of which was a "punched out" perforation one-fourth of an inch in diameter.

In several instances where I have assisted in the operation for primary closure of duodenal perforations, while the patient recovered from the operation the symptoms recurred, bismuth studies showed retention of the gastric contents, and subsequent gastroenterostomy became necessary before permanent relief was obtained. I recall one case of acute perforation of a duodenal ulcer in which operation revealed the abdominal cavity filled with food. In this case closure of the perforation was done, the patient recovering. Later, however, gastroenterostomy was performed.

It has seemed to me that one of the most characteristic clinical symptoms of duodenal perforation is the degree of abdominal rigidity. I recall a patient who had a sudden attack of severe abdominal pain while walking along the street and was taken to the hospital. When I saw him shortly thereafter he was walking about the ward with a normal temperature and pulse of 98.

Examination showed tremendous rigidity of the entire abdomen, and celiotomy was performed at once. We found a perforation of the duodenum which was closed and the man recovered. The rigidity in such cases is much greater than that occurring in perforations of the appendix.

RADIUM*

By C. J. BROEMAN, Cincinnati, O.

Every new discovery, when its value is put to a practical test, finds enthusiastic supporters and equally ardent detractors. Some of the physicians who are employing radium have no doubt become over-enthusiastic about its value putting it forward as a universal panacea because some most unexpected and remarkable results have followed its employment, but nevertheless, the fact remains that radium is here to stay, and moreover, has a field in medicine separately and peculiarly its own, a field which drugs or surgery or x-ray therapy can never occupy. It, therefore, behooves every physician to inform himself concerning it, even if he has no intention of making use of it personally, for the public interest has been so much aroused by the reports concerning radium, which have appeared in literature and the accounts of the almost miraculous results which have at times followed its application, that the medical man who is not armed with exact information concerning it may be put in a position of great embarrassment by the first inquiring patient who questions him about it.

Perhaps the most frequent question he will encounter will be: How much is it going to cost? Owing to the great scarcity and consequent high price of the element there is a popular impression that radium treatment is very expensive. This is far from being the truth. Even when one considers the cost of the mechanical equipment—which is considerable—and the special training required before one can become a competent operator, these initial costs are more than offset by the fact that the treatment seldom requires an extended sojourn in the hospital, as in many cases it can often be administered in the physician's office. As the applications are absolutely painless it is frequently possible for the patient to receive them without interruption of his regular employment, which is, of course, out of the question if a surgical intervention is undertaken. When these considerations are taken into account it will be seen that the patient should be able to pay a rea-

sonable fee for his treatment without assuming an overwhelming financial burden.

Physics of Radium.

"Radio-activity is the power of spontaneously sending out rays which penetrate through all forms of matter, affecting photographic plates in darkness and discharging electrified bodies." Radio-activity was discovered twenty-four years ago by Becquerel, a French physicist, while he was working with uranium oxide. Two years later, in 1898, Madame Curie discovered a radio-active substance possessing an activity several million times greater than uranium. This, she called radium. It is found in a number of radio-active ores, such as pitchblende-uranite, chalcocite, thoramite and carnotite. Carnotite is mined in Colorado and is the only source of radium in the United States. Uranium exists in it in a proportion of about



Epithelioma upper and lower lids of right eye, involving inner canthus.

two per cent, and from this radium is extracted, about thirty-five tons of ore being required to furnish one hundred milligrams of radium element. There are about three ounces of radium now in existence, and each ounce is valued at \$260,000.

When we speak of using so much "radium" it is not the element itself which is referred to, but one of its bulkier salts or its gaseous emanation. The purchaser of a hundred milligrams of radium receives it in the form of radium bromide, or chloride (soluble) or sulphate (insoluble) just as though the purchaser of a dram of metal sodium should receive an equivalent amount of sodium chloride or common salt. One milligram of the element

*Read before the Scott County Medical Society.

corresponds to 1.87 milligrams of the bromate, 1.31 of the chloride, 1.265 of the carbonate and 1.42 of the sulphate. The yearly decay is three-one-hundredths of one per cent; that is to say, in one thousand, seven hundred and fifty years radium will lose one half of its strength, and at the end of twenty thousand



Three months later having received 550 mg. hours of radium treatment. Apparently cured.

and years virtually none of it would be left.

Emanation may be termed the "vital spark" of radium. It is an element formed of radio-active matter, but it must be remembered that it is not a ray. When it transmutes (changes) it gives off an Alpha ray. The life of the emanation is much shorter than that of radium itself, as half of any quantity of emanation decays in 3.85 days, and the remaining half in an equal space of time, so that at the end of forty days only a minute quantity will remain. During the decay process each of the decay products gives off rays.

There are three kinds of radium rays, Alpha, Beta and Gamma, named after the first three letters of the Greek alphabet. The Alpha rays constitute 90 per cent of the total radium energy. They have a velocity of 12,000 miles a second—which is one-twentieth the velocity of light—but they are very easily cut off with a "screen" or "filter," such as a sheet of paper, and can travel through the air a distance of only thirty-three centimeters. Because of the enormous energy with which the Alpha rays are shot out from the transmuting atom, they produce the greatest heating effect of the three kinds of rays, furnishing 123.6 of the total of 134 calories produced by one gram of radium in one hour. The

Alpha rays are the least penetrating of the three.

The Beta rays are one hundred times more penetrating than the Alpha, and their velocity is much greater, being the same as light. They constitute about nine per cent of the total energy of radium. They are almost completely absorbed by a thickness of eight millimeters of aluminium or two millimeters of lead. The Beta rays are the true "burning rays" for unless the surface which is to be irradiated is protected by lead, aluminum, brass, silver or rubber, long exposure to them will produce characteristic burns. There are three kinds of Beta rays, soft, medium and hard, the last named being the most penetrating.

Gamma rays are one hundred times more penetrating than Beta. Although analagous to x-rays produced in a hard vacuum tube, they are much more penetrating, as they will pass through a man's body at the level of the thorax and illumine a radiosopic screen on the other side. After passing through one centimeter of lead about 40 per cent of the Gamma rays will be absorbed, and when ten centimeters have been passed through 0.6 per cent will still be unabsorbed. The Gamma rays which encounter matter, either tissues



Epithelioma of the neck just beneath the lobule of the right ear; duration two years.

or the screen, develop into secondary Beta rays. In medical work the Gamma ray is the most important as it has a selective action upon diseased cells. As its penetration is in a direct line the applicator must be placed parallel to the part to be treated.

Technique.

The physician working with radium can secure the best results by co-operating with those who have made a special study of the region which is to be irradiated. I never attempt to treat disease of the nose or throat without consultation with a laryngologist, so



Three months later. Apparently cured after 1200 mg. hours of radium treatment.

that I may be certain that the radium is placed exactly where it should be. In the same way when dealing with a difficult uterine condition I have sought the help of a competent gynecologist. Care in placing the radium is one of the very important factors influencing the outcome of the treatment, and all dosage must be adapted to the requirements of the individual patient and the amount carefully calculated by the operator. Success is largely dependant upon attention to these details.

Radium is applied in several ways: By means of flat applicator or plaques; in tubes; by means of needles or by glass capsules in which the radium emanation is sealed up and used in place of the element itself.

The flat applicators designed for dermatological work may be of any desired size or shape, but the usual form is a metal plaque from one to four centimeters square, over which the radium is evenly distributed after being mixed with a suitable varnish or enamel. Sometimes the radium is first enclosed in aluminum, so that, should the enamel be cracked or chipped, the radium would not be lost. This aluminum will absorb the Alpha

rays. The screens most commonly used for the plaques are squares of aluminum, brass or lead, varying in thickness, that of the brass being from 0.3 to 2.0 mm. Plaques are sometimes equipped with handles for facilitating their use under special conditions.

When tubes are employed the radium compound—preferably the insoluble sulphate—is sealed in a thin glass-walled tube at least no greater than is necessary to hold the firmly packed material. The glass tube is then placed in a silver container having a wall two millimeters in diameter, and of a length one-half millimeter in thickness, and this container is fitted into a brass capsule the wall of which is one millimeter thick. When not in use the glass tube with its two outer containers is enclosed in a nickel-plated case, which is lined with lead and one inch in diameter.

Needles are used when it is desirable to imbed the radium in the center of the tissues which are to be irradiated. They are made of ten-carat gold, with a point of platinum or non-corrosive steel. When the needle is plunged into the middle of the growth no filter is necessary. Needles may also be used in the same way as tubes, when enclosed in brass, etc., and suitable handles for both tubes and needles can be obtained if desired.



Four months later, after 600 mg. hours of radium treatment. One year after treatment, examination showed no evidence of recurrence.

Radium emanation is a radio-active gas derived from the element by atomic reduction. The purified gas is sealed in glass tubes or bulbs, and is used in exactly the same manner as the radium itself. As the life of the

emanation is very short, if it is used constantly, fresh preparations must be made at frequent intervals, necessitating a large supply of radium. Under such conditions the minimum quantity necessary to have on hand would be about two hundred milligrams, and a large supply would be found very convenient. From a station provided with 500 milligrams of radium the output of purified emanation would be perhaps seventy millieuries a day, a millicurie being that quantity of radium emanation which exists in equilibrium with one milligram of radium element.

Radium has been administered by inhalation and by subcutaneous and intravenous injection. Most of this work has been carried on in foreign countries.

When deep malignant disease is to be treat-



Endothelioma, right parotid gland. Duration twenty-five years.

one days—ten days on an average—it is followed by a reaction, often severe and very painful. This is especially likely to occur in cases where the patient has had several treatments of large applications close together, so that he experiences what might be termed an accumulative reaction.

This reaction is manifested in one of four degrees: (1) Erythema, (2) erythema with desquamation, (3) vesication with superficial ulceration, and (4) deep ulceration. All tissues treated with radium react in some way, the manner of this reaction depending upon (1) the apparatus, screening and dosage employed, (2) the nature and condition of the tissue treated, (3) the extent of the application, and (4) personal idiosyncrasy of the patient. Ordinarily the reaction is characterized by an increased hyperemia of the skin, occurring about ten days after the application, followed by the shedding of the epidermis and formation of a vesicle. In about twenty days an ulcer will form under a crust, which falls off in four or five weeks, leaving a cicatrix which is depigmented, hairless, smooth and supple.

In the employment of radium it must always be remembered that it is a very powerful agent and that much care and study in addition to experience are necessary for its successful use. Not only must the operator have a comprehensive understanding of the action of the rays, but also he must acquire an exact knowledge of the activity of his plaques and tubes. Likewise he must have a thorough knowledge of the disease or condition he is trying to cure. The basal-celled epithelioma must be treated quite differently from the prickle-celled type, plaques being used for the basal-celled while the treatment of the prickle-celled necessitates the employment of tubes. One patient will react more severely and quickly to the action of the radium rays than will another. One who is suffering from a chronic localized patch of eczema usually reacts in a comparatively short time and to a marked degree, such skin blistering and becoming irritated much sooner than normal skin. Strange as it may seem, a large tuberous naevus will do beautifully under radium, while a spider naevus cannot be treated with radium at all. This is because the spider naevus contains no naevus tissue, nor any hyperplastic naevus blood-vessels which can be acted upon by the Gamma rays. The dilated central point and the radiating capillaries are easily obliterated with the electrolytic needle.

Method of Administration.

There is every reason to believe that the next ten years will see a great reduction in the

ed with radium, the effort is to get sufficient quantities of the rays to the growth without destroying the intervening healthy tissues. This is accomplished by "cross firing." Healthy tissue is four times more resistant than diseased tissue to the destructive action of the rays. By placing the radium at different angles to the growth cross-firing can be obtained, so that the same diseased tissue is constantly irradiated, although a different healthy tissue is exposed to the rays at each application.

It appears to be a common misconception that radium acts like a canter, that it "cures by burning out." Nothing could be further from the actual fact. The application of radium is painless, but in from three to twenty-

present high mortality rate of cancer through the application of radium. At present this disease yearly exacts a toll of ninety thousand lives, the mortality being particularly heavy among women over forty, as the female genital organs are especially susceptible to attack by it. In the field of gynecology radium can be used to the greatest advantage.

An intra-uterine application of fifty milligrams of radium properly screened will abolish menstruation for a period extending from three months to a year, or produce a permanent menopause if desired, depending on the number of milligram hours received by the patient. In menorrhagia and metrorrhagia occurring in women near the menopausal age radium is the treatment, of choice, but in younger women it should be used with caution. It is ideal for use in non-malignant bleeding of unknown origin, and has given favorable results in controlling endometritis and leucorrhea.

The results with fibroid tumors are uniformly good, some claiming from 90 to 100 per cent of cures without any mortality. If the case is complicated by lateral inflammation, dermoid or ovarian cyst, or urgent pressure symptoms, surgical intervention is advisable, and abdominal myomectomy is preferable to radium in cases of definite fibroids with bleeding, if the patient is under thirty-five and desirous of having children. Radium acts by producing an endarteritis and also by cauterizing the endometrium of the uterus. It is preferable to the x-ray which causes a cessation of ovarian activity and must be applied a number of times, whereas one application of radium is usually sufficient.

In malignant cancer of the uterus radium is indicated in all operable conditions where constitutional peculiarities make the employment of surgery inadvisable or impossible, and should be used in all inoperable cases or those of recurrence after operation, as it arrests hemorrhage, lessens discharge, and retards growth, while ameliorating the pain, healing ulcerations and improving the general condition of the patient. This is true whether the growth occurs in the body of the uterus or the cervix, though the first should be operated if possible, and subsequently treated by radium.

Janeway believes radium alone to be the best treatment for carcinoma of the cervix. He compares the results of the Wertheim operation, which in the hands of the best operators gives a mortality of over 25 per cent, with the ultimate cure of only 27 per cent, with radium treatment, which has no primary mortality and a far higher percentage

of cures. Following operation the three-fourths of the uncured cases are subject to operative sequelae such as vesico-vaginal or recto-vaginal fistula, and if the disease has already progressed into the parametrium (as shown by microscopic examination of a uterus removed by Wertheim operation) recurrence and death are inevitable.

In cancer of the breast surgery is advisable, making use of radium if the condition is inoperable or recurs. Radium is very powerful as a prophylactic treatment following operation upon the breast, and also after removal of a cervical or uterine cancer. Radium application is particularly useful upon the glands of the axilla.

The growths in the rectum which give the

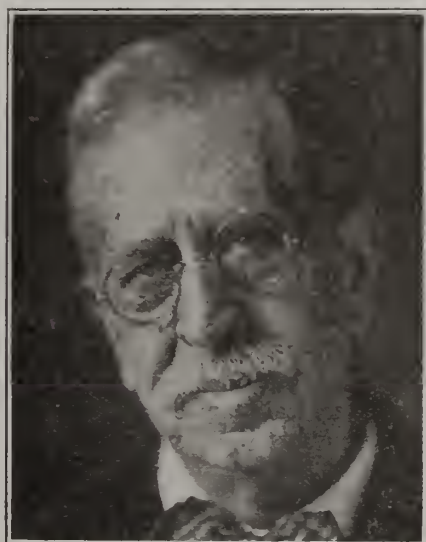


Epithelioma of the chin; Curation twenty-four years; also epithelioma under left eye; twelve years duration.

most favorable results after radium treatment are the annular, vascular type, the hard nodular varieties being less amenable to this form of therapy. Radium, however, should be tried in all operable cases. One of my own patients had a carcinoma about seven inches from the anus, which was rapidly closing off the rectum. By radium application I was able to restore the lumen so as to permit the passage of feces. This patient was later prevailed upon to undergo a colostomy and died in two days. In another case where the patient was a woman of 42, there was a growth one inch from the anus which had been present about four months, accompanied by the characteristic symptoms of pain, bleeding, loss of weight, etc. With three radium treatments I not only controlled the symptoms, but

also after the lapse of one year the patient appears perfectly cured. This case might have been operated, but by the advice of a very competent surgeon, radium was employed instead.

Carcinoma of the bladder and prostate usually do best under a combination of surgery and radium, and if taken early the prognosis is favorable. Radium alone has proved beneficial in these conditions. No cures have been reported in carcinoma of the stomach and intestines, although bleeding has been arrested. In these cases the radium tube is swal-



Three months later; 700 mg. hours to chin; 500 mg. hours to epithelioma under left eye. Both apparently cured.

lowed by the patient and its position in the stomach determined by x-ray.

In carcinoma of the oesophagus the outlook is favorable if the case is seen in the beginning, but this condition in the tongue, palate, or buccal and pharyngeal mucous membranes is very refractory to radium. Better results can be obtained in carcinoma of the tonsil, but in the larynx, although it is advisable to employ radium, the prognosis is very poor. In all mouth cases, any glandular involvement should be surgically treated. Carcinoma of the lip when treated early gives uniformly good results. The cervical glands should either be removed by surgery or treated by deep radium therapy. Here radium has yielded a higher percentage of cures than any other known method.

Sarcoma affecting the naso-pharyngeal region and the lympho-sarcoma at first respond readily to radium treatment, but the improvement is only temporary. The periosteal do better than the endosteal, and the spindle-

celled than the round-celled variety. Fibromata of the nose and papilloma of the vocal cords or of the bladder are improved by the employment of radium and some cures have been reported.

Endothelioma—most frequently encountered as a tumor of the parotid gland—does well with prolonged radiation and heavy screening. My case of endothelioma of the right parotid is still apparently well after the lapse of more than a year. Three treatments of 600 mg. hours each were employed. The enlarged thymus glands of children improve greatly with radium treatment. Brayton and Hueblin report the cure of symptoms in thirty-four cases.

In exophthalmic goiter the use of radium in conjunction with routine medical treatment should be strongly advocated. Usually the size of the thyroid is decreased together with a striking symptomatic improvement. The rays reduce the vascularity of the gland by affecting the blood vessels and this diminishing the secretion.

Cancer of the skin may be divided into two classes, the basal-celled or rodent ulcer and the prickle-celled type. I have treated about fifty cases of the basal-celled variety of epithelioma of the face, neck, ears and scalp by means of radium during the past year, and the results have been uniformly favorable, both from a curative and cosmetic point of view. I regard radium as the ideal treatment for epithelioma of the eyelids. The cosmetic result is at times almost unbelievably good.

My results with the prickle-celled carcinoma of the face, forehead, mouth and tongue have not been so gratifying and I attribute this to the following facts: We are dealing with a very malignant growth, prone to metastases, and whatever the method used, if it is to be cured, it must be treated early. All my unfavorable results were in cases either of long-standing, or where previous treatment had been unsuccessful; some with marked glandular involvement were hopeless from the start. It is often difficult to differentiate between the basal- and prickle-celled varieties, especially in the beginning, but if both physician and patient could be brought to realize the importance of instituting proper treatment immediately upon the appearance of a suspicious nodule, we could cure all cutaneous cancers, since radium seldom fails if only it is applied in time.

Many heretofore stubborn and incurable dermatological conditions are now being improved and eradicated by means of radium. It is especially valuable in the angioma of children, because it is painless and easy to

apply. Its cosmetic results are superior to those obtained by any other method. Lymphangioma as a rule respond to radium therapy, as do keloids and lupus erythematosus and chronic eczema of the mucous membrane of the lips, of which I have been able to cure four cases of bipus erythematosus and two of the mucous eczema. Both lupus vulgaris and erythematosus are distinctly improved by radium therapy and some cures have been reported; tuberculosis varrucosis cutis also responds beautifully to radium, as I discovered in an unusual case in which the nose and cheek were affected.

When plantar warts do not respond to CO₂ snow or the electric needle, radium may be of service. A patient of mine, who was a stenographer, was greatly hindered in her occupation by a wart under the nail of the left index finger which had resisted all the usual forms of treatment. Radium effected a complete cure.

In sycosis vulgaris, intractable pururitis (as of the anus) localized eczema and psoriasis, lichenifications, leucoplakia of the first degree, and other skin affections, including x-ray burns, radium is proving invaluable to the dermatologist.

Aiken who has treated one hundred cases of goiter with radium says that its action is about the same as that of the x-ray, but has the advantage of the constant emission of the rays which makes exact dosage possible, of being easily applied without the necessity of a noisy exciting apparatus, and of much deeper penetration of the tissue.

Other conditions in which radium is proving extremely useful are tuberculous adenitis, in which—when properly eradicated—the glands become quite small and the disease is arrested by an encapsulating fibrosis; eye conditions such as cataract, conjunctivitis and catarrhal folliculitis; vernal or spring catarrh, in two cases of which I have had remarkable improvement, and certain systemic diseases, such as splenomedullary leukemia, pernicious anemia, and Hodgkin's disease, where the therapy has proved beneficial.

During the past year one hundred and fifty-six cases have been referred to me for radium treatment. These included a large variety of epitheliomas, carcinoma, both operable and inoperable, prophylactic treatment following hysterectomy and other surgical interventions, sarcomas of both glands and bones, numerous tubercular conditions, and a large number of skin conditions, such as naevi, lupus erythematosus of the lip, lymphangioma of the scalp, etc. The general results have been strikingly favorable.

CONCLUSIONS:

Radium is the ideal treatment for all forms of basal-celled epitheliomas, and for prickle-celled epithelioma, if it is seen early and no glandular involvement is present.

Radium is to be preferred in certain uncomplicated cases of uterine fibroid and bleeding, and should be universally used in cancer of the cervix, and inoperable cancer of the body of the uterus. It is also indicated when carcinoma occurs in other parts of the body when treatment can be instituted early, particularly in the lip, rectum, etc. In all forms of inoperable cancer, it will relieve pain and hemorrhage and lessen discharges.

Radium is of service in the treatment of exophthalmic goiter, certain systemic diseases and various skin affections.

In closing, let me once more endeavor to impress upon the minds of every one present the great importance of recognizing and treating all forms of cancer at the earliest possible stage, and of curing all pre-cancerous conditions, of the skin, cervix and so on before they have opportunity to become cancerous, by the use of radium or some other reliable agent. From my own experience I feel justified in affirming that radium is here to stay, and that the physician who is not willing to recognize its value to medical science is simply refusing to read the handwriting upon the wall.

Diagnostic and Therapeutic Technic.—A manual of Practical Procedures employed in Diagnosis and Treatment. By Albert S. Morrow, M. D., late Lieut.-Colonel, M. C., U. S. A., Attending Surgeon to the City Hospital; and to St. Bartholomews's Hospital, New York City, Consulting Surgeon to the Nassau Hospital, Mineola, L. I. Third edition, entirely reset, octavo of 894 pages, with 892 illustrations, mostly original. Philadelphia, and London: 1921. Cloth, \$8.00 net.

For this edition Dr. Morrow has subjected every page a rigorous revision, so as to have it reflect all the advances in the fields covered developed during the war and since. Sixty-four pages of new matter and thirty-two new illustrations have been added.

The work is really a Minor Medicine, dealing with those practical procedures which lie on the borderline between medicine and surgery. After a description of the general methods, the measures employed in the diagnosis and treatment of diseases of special regions and organs are discussed. Everything is described in detail; nothing is left to the imagination, nothing is omitted. Every step in every procedure is not only described precisely, but is illustrated with good line drawings—clear, clean-cut pictures that show you at a glance just what to do and how to do it.

BRAIN TUMOR: REPORT OF CASE AND
EXHIBITION OF SPECIMEN*

By B. F. ZIMMERMAN, Louisville.

J. L., male, aged 41, married, designer, referred by Dr. E. L. Henderson. There was nothing of interest or significance in his family history. Several years ago he had pneumonia, followed by empyema of the right pleural cavity, which necessitated an extensive operation. About four and a half years ago he began to suffer from vertigo and severe headaches. There was no vomiting at this time, but later it became a disturbing symptom. His symptoms were attributed to infected tonsils. Tonsillectomy failed to give relief. He soon began to stagger. The ataxia became so severe that he was often unjustly accused of being intoxicated. It was at this time that vomiting began. Nausea usually accompanied the emesis. A blood Wassermann was +++. Active antihelietic treatment was instituted and his condition improved. Just how intense this treatment was or how long it was continued I was unable to accurately determine from the history.

About one year after this he was again given antisyphilitic treatment in an eastern city with negative results. In all, ten doses of arsphenamin were given. At this time he was actively engaged at work in the engineering department of an aeroplane factory and was able to discharge his duties (that of designer) to the satisfaction of his employers. He was at this time and had been for months using large doses of morphine. The headache was paroxysmal and severe, usually accompanied by vomiting.

He was finally forced by the severity of his symptoms to discontinue his work. He returned to this city and Dr. C. G. Hoffman saw him in January, 1919. Wassermann tests of blood and spinal fluid done by Dr. Stuart Graves were both negative. He was referred to Dr. Joseph D. Heitger for the Barany test. The result of the examination indicated a lesion of the posterior fossa.

I saw the patient for the first time December 8, 1919. He was a rather tall, sparely-built man, poorly nourished, and emaciated; walked with an unsteady gait. Glandular, osseous, cutaneous and genito-urinary systems and abdomen negative. There was a large depressed area and scar over the lateral aspect of the right side of the thorax. The lungs were negative except for suppressed breathing over the above area. Heart sounds clear, no murmurs and no hypertrophy. Pulse

rate 74, systolic blood pressure 128. Pupils widely dilated, notwithstanding the fact that he had taken one-half grain of morphine one hour before. Pupillary reflexes sluggish; patient said his vision was defective. There was spontaneous nystagmus to the right and also more marked to the left. He also had spontaneous vertical nystagmus.

Nervous system: He complained of severe headache, temporal and occipital; also complained of severe pain "behind" his eyes. He seemed dazed; talked slowly and hesitated at times as if groping for the word he wished to use; there was no aphasia. It was difficult to determine how much of his mental state was due to the narcotic and how much to his malady. From his wife it was learned that he was frequently irrational for periods ranging from a few minutes to several hours. The reflexes furnished no information of value. There were no areas of anesthesia or hyperesthesia; no paralysis; he walked with an unsteady gait, a gait not unlike one nearly blind. He did not deviate more to the right than to the left, and there was no tendency to fall forward or backward. He could stand with eyes closed, but swayed more than normal. There was no apparent dysmetria, but it was difficult for him to execute the tests for cerebriety. There was no adiadokokinesis, though here again the alternate movements of pronation and supination were slowly executed.

Eye examination and Barany tests by Dr. Heitger. There were bilateral choked discs and beginning optic atrophy. On account of the patient's mental condition perimetric tests were not made. The Barany tests pointed to a sub-tentorial lesion.

On December 15, a right subtemporal decompression was done. The neurologic examination, while strongly suggestive of a posterior fossa lesion, was not conclusive. With the possible exception of the vertical nystagmus all symptoms could be explained by a frontal lobe lesion. The Barany test definitely indicated a sub-tentorial lesion.

The subtemporal decompression was decided on for the following reasons: (1) Lack of positive neurologic localization. (2) We hoped by the operation to relieve the headache and lessen the destructive action of the pressure upon the optic nerves. (3) By reducing the amount of narcotic to get the patient in better condition for the more serious suboccipital exploration.

The dura was very tense but pulsated slightly. When it was incised the brain at once herniated through the bony defect. So marked was the protrusion that a ventricular puncture was necessary before the temporal fascia could be accurately closed. The punc-

*Read before the Jefferson County Medical Society.

ture was made at Keen's point. The ventricular fluid spurted to the height of eight inches. One c.c. of neutral phenolsulphonephthalein was injected into the ventricle. None of the dye appeared in the spinal fluid in thirty minutes, indicating an obstruction in the ventricular system. The dye was still present in the urine at the end of forty-eight hours. Five days later spinal phthalein test showed normal absorption from the subarachnoid space. Functional phthalein test of kidney by intramuscular injection showed normal elimination.

Eighteen hours after the operation the patient became comatose with slow pulse and Cheyne-Stokes respiration. Blood pressure 140 m.m. This condition lasted several hours. After the first week the headache was much improved and the morphine was reduced. Invariably with a paroxysm of headache the hernia increased in size and became very tense. Ventricular puncture would relieve the pain. The nystagmus did not improve, nor did the swollen discs recede. The pupils contracted to about normal but always dilated during the paroxysm of pain.

At the end of four weeks a suboccipital decompression was decided on, but the patient had an attack of pneumonia, from which he recovered, and then developed a number of furuncles on the back of his neck which again delayed operation. In the meantime his mental condition became much worse. He had frequent attacks of *petit mal* and a few of *grand mal* of a mild type. He died rather suddenly on March 28. I did not see him at this time, and do not know just what symptoms he presented at the end.

An autopsy was made by Dr. Stuart Graves, of the Pathological Department, University of Louisville, and his remarks concerning the brain follow:

On removal of the brain, which weighs 1550 gms., there is found a neoplasm in cerebello-pontine angle on left side of brain stem. It is uneven, rather soft, slightly raised, fairly sharply defined, but not encapsulated. On section it appears soft and mottled with blotches of gray and red. After fixation of brain horizontal sections at successive levels of one and two cm. deeper show an expanding, soft, red and gray neoplasm with disintegrated, hemorrhagic areas. Its outline is fairly definite, but not sharp, as if it were growing largely by expansion, although surrounding cerebellum does not appear compressed. In places the tumor falls away from the normal tissue. At no point does it appear to invade the stem. At deepest level sectioned it is 35 mm. in an antero-posterior

diameter and 55 mm. in a transverse diameter, extending 25 mm. to right of mid-line.

Microscopical diagnosis: Glioma with retrograde changes and hemorrhage. (Stuart Graves).

COMMENT:

There are several points in connection with this case which stand out prominently:

1. The diagnosis of syphilis of the central nervous system based on one blood Wassermann was a mistake; the cerebrospinal fluid should have been carefully examined. This is a mistake that has been frequently made in the past. The improvement shown after vigorous antileptic treatment is not unusual in brain tumors. Attention was called to this years ago by Head and Sir Victor Horsley, but their teaching is not yet fully appreciated. Much valuable time may be lost by such mistakes in diagnosis.

2. Exact, anatomical localization is not yet possible in all surgical lesions of the posterior fossa: (a) because the entire function of the various structures is not yet known, and (b) the anatomical arrangement of these structures is such that neighborhood symptoms and false localizing signs are easily produced. No effort should be spared to make an accurate localization in every case. For practical surgical purposes, however, it is necessary only to locate the lesion in the sub-tentorial region.

3. What is the explanation of the sudden attack of increased intracranial pressure eight hours after the operation? Three things are to be considered: (a) free hemorrhage, (b) edema or sudden swelling of the tumor, (c) effect of the phthalein injection of the ventricle. The first condition, free hemorrhage, can be eliminated because hemostasis was complete when the wound was closed and the duration of the symptoms was too short for hemorrhage. Either of the other two may have been the cause. It is noteworthy, in this connection, to call attention to the fact that Dandy has discontinued the use of phenolsulphonephthalein in the ventricle because of severe reaction caused in some cases; he now uses indigo-carmin.

4. That the acute exacerbations of headache were caused by sudden increase in intracranial pressure is, I think, conclusively proved. After the operation every attack was accompanied by swelling of the hernia. It would at times become so tense that pulsation could not be detected. At the same time the pupils would become widely dilated. The mentality was more clouded and at times there were periods of unconsciousness. Ventricular puncture with withdrawal of 30 c.c. to 60 c.c. of fluid would be followed by

relief of pain, contraction of the pupils, and restoration of consciousness.

In searching for the possible cause of this phenomenon one may be forced to theorize. It will be remembered that the phenolsulphonophthalein after ventricular injection did not reach the spinal canal within thirty minutes. This is taken to indicate a block in the ventricular system and an increased intracranial pressure. At autopsy the medulla in the region of the fourth ventricle was deformed. The structures were pushed well to the right. This might conceivably produce an obstruction of the aqueduct or a closure of the foramen in the ventricle with a consequent increase of pressure in the ventricle. In other words, an increased pressure above the tentorium. Or the condition might have been one of increased pressure in the sub-tentorial compartment incident to localized edema or sudden vascular change in the tumor. The blood vessels of gliomata are immature structures and are believed by some neuropathologists to readily undergo changes in caliber thereby affecting the size of the growth. This tumor was very vascular and was therefore, one that might easily increase in size with vascular dilatation. If there were a sudden increase in sub-tentorial pressure, one would expect more marked effect on pulse and respiration than was shown in this case.

DISCUSSION:

Jos. D. Heitger: I first saw this patient January 27, 1919, when he was referred to me by Dr. C. G. Hoffman for examination of his vestibular apparatus. According to the history, about four years previously he began to have headache and vertigo. He had some tonsillar symptoms at that time, and tonsillectomy was performed without relieving the headache and vertigo. Three years before a four-plus Wassermann of the blood was obtained and antiluetic treatment was instituted. In January, 1919, both blood and spinal fluid Wassermann were negative. The preceding summer he had a very severe attack of vertigo associated with nausea, vomiting and headache, parietal and occipital. Since then vertigo and headache had been more or less continuous. Neurologic examination was negative. Hearing tests disclosed a slight middle ear deafness with a shortened bone conduction. Rinne's test was positive; Weber's in the head. Patient had spontaneous nystagmus to right of second degree and also to left, more marked, of second degree. Spontaneous vertical nystagmus was also present. No spontaneous past pointing was elicited. In being tested for pelvic girdle reactions the patient fell to the right, or left, or forward, but not backward. On turning to right a horizontal nystagmus to left of twenty seconds dura-

tion and good amplitude was elicited. Past pointing was present but subnormal; vertigo also was subnormal, of ten seconds duration. On turning to left a horizontal nystagmus to right of thirty seconds duration and good amplitude was obtained. Past pointing and vertigo were present but subnormal. Falling reactions were normal. The patient was much disturbed by the turning, suffering from nausea and vomiting. He was told to return the next day for ear douching, but failed to appear.

I was asked to see the patient again February 18, 1919 by Dr. W. A. Jenkins. Examination showed spontaneous vertical and horizontal nystagmus of the second degree to each side still present. There was slight choking of both discs, the right being more involved than the left. The patient had been in bed for three weeks. Neurologic examination was negative except for a slight dysarthria. He also complained of photophobia and a sound of falling water in both ears, of the same degree on each side. Fields taken at this time were negative. Vision was normal, as was the tension of both eyes.

I saw nothing more of the patient until December 12, 1919, when asked to examine him by Drs. Zimmerman and Eggers. Spontaneous vertical and horizontal nystagmus of second degree to each side still present. Turning to right produced horizontal nystagmus to left of large amplitude and twenty-five seconds duration. Vertigo and past pointing subnormal. On turning to left, horizontal nystagmus to right of large amplitude and twenty-seven seconds duration was obtained. Past pointing was exaggerated and prolonged with both arms; falling was normal.

On douching right ear with water at 68 degrees F., the head being 30 degrees forward, a rotary nystagmus to left was obtained in one minute and twenty seconds. The right arm past pointed once to the right, but the left arm failed to past point. When the head was thrown 120 degrees backward, a large horizontal nystagmus to left occurred, with subnormal past pointing of right arm, but none with left arm. On douching left ear with water at 68 degrees F., the head being 30 degrees forward, a rotary nystagmus to right was obtained after three minutes. The right arm showed subnormal past pointing, left arm no past pointing. With the head thrown backward 120 degrees a large nystagmus to right was elicited with subnormal past pointing of right arm but none with the left. Both discs were still choked with beginning atrophy.

The only localizing signs of value were obtained from the Barany tests, and suggested a posterior left fossa lesion. I advised approach to the brain posteriorly on the left. The other consultants disagreed with my findings, so a temporal decompression on the right was performed

as stated by Dr. Zimmermann in his report. The operation did not affect the spontaneous nystagmus or the choked disc, but did relieve the headache.

The most interesting features were the spontaneous vertical nystagmus and the blocking of both vertical canal fibers in the brain stem, with the absent past pointing of left arm by douching. The unusual feature was no disturbance of hearing in the left ear with the extent of the tumor involvement.

John R. Wathen: Unfortunately, as a rule, patients come to the surgeon too late for operations upon cerebral tumors to be successful. Glioma is a most malignant type of brain tumor and the majority of decompression operations therefore merely represent palliative treatment in cerebral surgery. If the surgeon waits until the oculist is able to make the diagnosis, based upon vomiting, headaches, choked disc, etc., he has waited too long for permanent benefit from operation. What we, as surgeons, desire is earlier diagnosis.

The method introduced by Dandy, of Baltimore, will enable us to perfect the diagnosis in about eighty per cent of cases. By this method the tumor can be visualized and in most cases positively located at a time when something can be accomplished by surgery; and it is only by radical operative procedures that we may expect any real progress along surgical lines. Decompression operations are palliative and are of value only to alleviate symptoms by relieving intracranial pressure.

Radium seems to have been of no benefit in gliomata of the brain, although favorable results have been reported by Frazier and others in the treatment of endotheliomata by this method. I hope in the future surgeons will see these patients earlier than has been possible in the past.

Claude G. Hoffman: My association in the case reported by Dr. Zimmermann was very limited, the patient being brought to me for treatment and not for diagnosis. He gave the history of having had syphilis three years previously for which intensive arsenphenamin treatment had been given in another city. On returning to Louisville, and his condition not being improved, the family insisted upon my giving him intraspinal medication, which I refused because I did not believe it was indicated. The clinical symptoms were more suggestive of a brain tumor than syphilis, and it was for this reason the patient was referred to Dr. Heitger for the revolving chair test. The blood and spinal fluid showed a negative Wassermann; the spinal fluid was under pressure and the cell count was exaggerated.

L. Wallace Frank: This is the second instance coming to my notice where the diagnosis of cerebral tumor has been delayed by the Wasser-

mann findings. Last summer I saw a man whose spinal fluid Wassermann was reported two-plus and diagnosis of syphilis had been made. The patient was given antiluetic treatment for over a month during which time he became steadily worse. An emergency decompression was then performed but the patient died, as stated in Zimmerman's case. In that case also there was marked herniation of the brain through the decompression opening and on attempting ventricular puncture the needle could not be introduced into the ventricle. The diagnosis of cerebral tumor was confirmed at autopsy. The tumor was above the tentorium and measured 5 cm. in diameter.

In sub-tentorial tumors choked disc usually progresses much more rapidly than in tumors above the tentorium.

An interesting feature in connection with brain tumors is that the tumor may grow to large size and not produce any localizing symptoms. Headache and marked choked disc are frequently due to obstruction of the ventricular system with consequent internal hydrocephalus, and not so often due to the tumor itself, i.e., the tumor may grow to large size and produce no symptoms until it encroaches upon the ventricular system.

Frank T. Fort: Cerebral tumors are among the most important lesions the surgeon is called upon to treat. I recall one case seen several years ago in which I believe earlier diagnosis might have been possible had a competent neurologist been called in consultation. After a decompression operation had been performed there appeared to be about as much of the brain outside the skull as inside because of the tremendous herniation. The patient died two years after the operation. Undoubtedly the operation afforded him temporary relief from the intense headache. The tumor was located in the right hemisphere; there was some paralysis of the left arm and leg; the eye symptoms were marked.

Patients with cerebral gliomata are usually hopelessly inoperable risks unless subjected to operation early in the course of the disease. No one can possibly determine the extent of the tumor in late cases until autopsy is performed.

I have seen Dr. Dandy inject gas or air into the ventricles, and while in some cases he was able to make the diagnosis earlier than might have been done otherwise, I think careful neurological study is the most important diagnostic measure.

In cerebral endothelioma, fibroma or beginning sarcoma a cure can be reasonably promised from the application of surgery; but in the majority of gliomata alleviation of symptoms with some prolongation of life is all that can be accomplished by surgical treatment.

B. F. Zimmerman, closing: If the paper presented suffices to call attention to the necessity of careful study of brain symptoms, not treating the patients for neurosyphilis simply because they have manifestations referable to the central nervous system, and a positive blood Wassermann, my efforts will not have been in vain.

This patient may have had syphilis, he had a positive blood Wassermann according to the report of a competent laboratory worker, and yet syphilis had nothing whatever to do with his cerebral symptoms. Whenever an individual shows evidence of marked nervous disturbance the central nervous system should be thoroughly investigated.

It would probably have made no difference at what stage we saw this patient insofar as cure was concerned. A glioma in this region is practically incurable in the sense that the tumor cannot possibly be completely removed. In gliomata located in a silent area of the brain (frontal lobe) if the diagnosis is made early and the tumor widely excised together with some of the adjacent brain tissue a cure may be promised in some cases. However, had this tumor been an endothelioma, which might have produced the same symptoms, an operation would probably have been successful.

Early diagnosis is the most important feature in the surgery of brain tumors. Unfortunately in the majority of instances the diagnosis is not perfected until the tumor has attained such magnitude as to seriously impair the mentality of the individual, and if removed at that stage normality is not restored. The location of the tumor will determine many of its signs and may thus enable early diagnosis and localization to be made.

Tumors of the posterior fossa often produce symptoms which indicate their location just as happened in the history of this case. We suspected a lesion in the posterior fossa based upon the neurological findings but we were not absolutely positive. The Barany tests located the trouble in the sub-tentorial region.

In Dr. Frank's case if the tumor was an endothelioma it could have been successfully removed. Endotheliomata do not infiltrate the surrounding tissues as do gliomata.

Tumors in the posterior fossa tend to produce more marked and rapidly choked disc than when other portions of the brain are involved, because they encroach upon the ventricular system thus producing obstruction and rapidly increasing intra-ventricular pressure. For that reason choked disc is a very early and marked symptom.

I want to again emphasize the necessity of carefully studying cases of this kind. The diagnosis of cerebro-spinal syphilis based upon a positive blood Wassermann should not be accepted until other lesions have been excluded. When

that has been done fewer patients will be given antilnetic treatment for months or years the tumor in the meantime steadily growing larger.

REPORT OF CASE OF EXTRAUTERINE PREGNANCY AT END OF THIRD MONTH WITH RUPTURE*

By FRED L. KOONTZ, Louisville.

Mrs. L. F., aged 25 years, mother of one child seven years of age, five years ago miscarried at eight months. No further pregnancy in five years. Last regular menstruation October, 1920, the fifth day. In November the period was delayed a few days, then came on and persisted for three weeks. During this time she consulted me at my office in company of her sister-in-law. At that time there was nothing especially noted in her condition; a prolonged menstrual period without pain and without clotting; decidual tissues, if present, escaping her attention or knowledge. In view of the fact that there had been a normal period the previous month, I prescribed cotarnine phthalate three-fourth grain every four hours. Two days later she reported by telephone that bleeding had ceased.

December 24 I was called to see her. She was complaining of pain in the lower abdomen and was exceedingly tender over lower zone. An examination was unsatisfactory and so painful that I did not complete it but ordered rest in bed and hot stupes. Under this, the pain subsided and two days later she was up and reported by telephone. I insisted that she come to the office for a thorough examination; this she neglected however. She did not tell me at that time that she had had a very severe sharp pain in the pelvis and had fainted and felt very weak afterward. I saw only the picture of a salpingitis which was borne out by her history.

In looking back I can understand what had happened. I think at that time she suffered an incomplete tubal abortion which nature took care of. I called to see her again on Sunday, January 2, 1921; she was in bed. I made a bimanual examination at this time and found a large mass on the right side and extending well down into the cul de sac. I made at this time a tentative diagnosis of ectopic gestation and advised her family of the danger and insisted on immediate removal to the hospital by ambulance. This was done Sunday afternoon and operation was scheduled for Tuesday morning, the first opportunity on the slate.

*Read before the Jefferson County Medical Society.

Her blood at this time showed 78 per cent polymorphonuclears with 22 per cent leucocyte count. Temperature 98 degrees F., pulse 80, respirations 24. During the night she vomited frequently and in the morning her temperature was 99 degrees F., pulse 120, respirations 24. I ordered saline proctoclysis and watched her closely during the morning. I left her at ten o'clock and returned at three taking with me Dr. Hamilton Long for an immediate anesthetic, if necessary, and Dr. Simrall Anderson in consultation.

We found the patient in collapse, the tube evidently rupturing during my absence. I ordered her to the operating room at once. She was unconscious and almost pulseless. A long median incision was made and the abdomen found full of blood. A tubal pregnancy at the fimbriated end had ruptured, a pregnancy I estimate at the end of three months. The vessels were large and numerous and the bleeding rapid. The broad ligament on the right side was at once clamped and the abdomen freed of a fearful quantity of blood free and clotted. The ovarian and the uterine arteries were tied separately as were the exposed open mouths of several new vessels. In addition the broad ligament was fixed and tied.

During this time, Dr. Long supervised the introduction of 700 c.c. of normal saline under the breasts which the patient "drank up" rapidly. I have mentioned the care taken to ligate the vessels separately in view of what happened later. She came off the table barely alive. At two o'clock A. M. she had failed to rally, pulse around 145, faint and irregular. I asked the interne then to call Dr. L. R. Ellars of the Louisville Public Hospital staff and request him to come and transfuse the patient. In the meantime I went for her brother who had consented to give his blood. The bloods were typed by Dr. Ellars assisted by Drs. McNeil and Ragsdale, and 500 c.c. of blood were taken from the donor by the citrate method.

Preliminary blood pressure showed as nearly as was possible to get a reading systolic 60 to diastolic 55. I requested of Dr. Ellars that the introduction be very slow as I have frequently observed the pressure to "shoot" very high following a rapid introduction. A half hour was consumed in the process. At 300 c.c. the pressure stood at systolic 120, diastolic 100. At 500 c.c. the systolic had jumped to 180 diastolic 145, the pulse rate dropping from 145 to 104.

At five o'clock in the morning the patient opened her eyes and smiled. There was color in her cheeks, her lips were pale pink, and pink was showing under the nails. During the forenoon of Tuesday her pulse continued

fast, climbing steadily until noon, when it reached 130, with a temperature of 100 degrees F.

Here I wish to speak of a phenomenon that I observed frequently in France after severe loss of blood. I refer to a marked rigidity of the body and a stiffness and soreness of the muscles which will cause the patient to cry out in pain whenever and wherever touched. In an attempt to turn the body its pliancy is gone and it rolls over stiffly as if in rigor mortis.

Examination of the dressings showed them to be saturated, and the outer dressings were removed. I had placed a large gauze drain to the bottom of the pelvis, and think I recovered on the dressings all of the 700 c.c. of normal saline introduced under the breasts plus that given by proctoclysis. By two o'clock her pulse had climbed to 140, temperature 100 degrees F. The color was fast fading from the lips and the dressings were saturated with bright arterial blood. I ordered morphine one-fourth grain with atropine one one-hundred-fiftieth grain and ice to the abdomen. Her condition continued grave until evening when I again called Dr. Long, determined to reopen the abdomen before losing so strenuous a battle.

Here is a condition which calls for the display of the nicest of surgical judgment. Your margin of activity between the two horns of the dilemma is so narrow that you stand to lose either way probably, and the wrong way certainly. Removing the dressing I inspected the wound and the hemorrhage was coming out of the lower angle, the exact bleeding point not being located. Dr. Long shrewdly called attention to the fact that the central gauze of my drain encased in rubber tissue, was white (this, too, without calling upon Dr. Watson for the needle). This fact precluded the origin of the hemorrhage deep in the pelvis. This fact with the knowledge of having so carefully ligated the vessels separately gave me a sense of security even in the fact of so dire a picture of distress. I abandoned temporarily the idea of reopening the abdomen. Flat pads of gauze were placed over the wound as a compress and tightly strapped down with adhesive. At the same time one c.c. of hemoplastin was administered hypodermically. After watching the patient for some time it was apparent that the hemorrhage was at last temporarily under control. Twelve hours later another c.c. of hemoplastin was given, the discharge thinning out and becoming watery, the pulse dropping slowly to 110, temperature 100 degrees F.

This patient, owing to the extreme gravity of her condition and the secondary hemor-

rhage plus the painful muscular rigidity, was kept on her back for a total of 36 hours, when a reddened spot was noted over the sacrum. Her position was immediately shifted and in spite of the efforts of two special nurses and every precaution the place broke down and there is a deep sloughing ulcer of 7.5 centimeters diameter which is complicating her recovery seriously. I cannot blame this condition on anyone. An earlier shifting of the position, I believe, would have been fatal, and if in 36 hours you get a bed sore after frequent rubbing of the back with alcohol and the use of a rubber ring, I can only ascribe it to the very low state of the patient's vitality.

The drain was loosened a little on the fifth day, partly removed on the seventh and completely on the ninth day. Her temperature has remained at 100 degrees F., pulse 110, until the fifteenth day when she had a chill and her temperature went to 104 degrees F. This was the last night, her pulse reaching 128. The bed sore was being dressed with iodoform gauze. And notwithstanding the fact that the lesion was covered with slough she showed unmistakable signs of iodoform poisoning, temperature 104 degrees F., pulse 128, respirations 28, great prostration, a sense of choking in the throat, copious emesis of yellowish fluid, with griping and involuntary bowel movement. Iodoform was discontinued. The temperature dropped to 100 degrees F., pulse to 114, and the slough showing signs of suppurating.

The specimen is exhibited for inspection. It was, of course, much larger while in a fresh state. It consists of the fetal sac and contents with the tube and ovary. The fresh specimen gave the following observations: length of fetus, 9 centimeters; weight, 15.1 grams; length of umbilical cord, 17 centimeters.

Minot, Heisler, His, Preyer, Toldt, Hennig and Hecker are the authorities upon whose data I place the age of this gestation at the end of the third month. Toldt's length of fetus at that age is 7 centimeters, Hennig's 8.4, Hecker from 4 to 9. This one measured 9 centimeters. Hecker fixes the weight at the beginning of the fourth month at from 10 to 17 grams. This one weighed fresh 15.1 grams. Heisler places the beginning of ossification of the os innominata at the end of the third month, and I hope to be able to show this on the screen.

In conclusion I wish to emphasize the fact that early diagnosis of ectopic gestation is at best only a shrewd guess, all signs failing frequently; also to call attention to the fact that this case went about twice the usual length of time before rupture occurred.

DISCUSSION:

L. R. Ellars: This case is one of unusual interest and is the kind that should be reported more often before our societies.

Dr. Koontz called me to see this patient relative to a blood transfusion, and her condition to say the least was extreme. She had a white waxy color and pulse was barely perceptible. And here I would like to call especial attention to a point mentioned by Dr. Koontz, namely the rigidity and muscle soreness which the patient presented. She complained a great deal more of the general pressure caused by the blood pressure cuff, than the actual puncturing of the vein with a needle.

We decided that a blood transfusion would be the greatest benefit to the patient, and, accordingly, with assistance of Drs. Ragsdale and McNeil, 500 c.c. of blood was taken from the brother and given slowly to the patient with the result just mentioned by Dr. Koontz.

I would like to say a few words here about the method of selecting a donor, as the opinion seems to prevail that this is a difficult procedure, when as a matter of fact both the selecting of a donor and the actual transfusing of the patient are very simple.

The Moss method of grouping bloods into types 1, 2, 3, and 4 so that we may know the compatibility of the various bloods, and have for instant call a person of type 4 (who can give to anyone) is well enough for army service or large institutions, but isn't practical for emergencies that arise from time to time where these ideals are not present.

All we have to bear in mind is the accepted rule, that the patient's blood cells in his own sera are safe, and if one can prove that the recipient's serum does not agglutinate the cells of the donor we know we have an available donor and that transfusion can be done without danger. Naturally syphilis, etc., should be excluded in this selection.

For practical purposes the test is made as follows: 5 c.c. of blood is obtained from recipient with Leur syringe and placed in centrifuge or allowed to stand so as to collect serum. One drop of donor's blood is placed in 2 c.c. of 0.2 per cent sodium citrate solution, which gives suspension of red blood cells. One drop of this suspension is added to 3 drops of the serum obtained from recipient and placed on glass slide under microscope. If agglutination occurs by the end of 20 minutes the bloods will not mix, but if there is no agglutination the transfusion can be done without danger.

The actual transfusion is performed as follows: The donor's vein is punctured with as large a needle as possible, preferably a No. 11, and the blood allowed to flow into a sterile 500 c.c. cylinder in which has been placed 50 c.c.

of 0.2 per cent sodium citrate until the 500 c.c. mark is reached. The blood should be stirred continuously while being withdrawn to insure mixing. We now have 500 c.c. of blood containing 0.2 per cent sodium citrate.

This is strained through 4 thicknesses of gauze, placed in an ordinary intravenous apparatus, and allowed to flow into the recipient's veins slowly by gravity.

SUCCESSFUL LIGATION OF THE COMMON FEMORAL ARTERY; CASE REPORT*

By L. R. ELLARS, Louisville.

R. H., male, aged 20 years, was admitted to the hospital as an emergency on the night of April 1, 1920, having received a gunshot wound of the left thigh about one-half inch below Poupart's ligament in the middle.

Examination showed a wound about one-half inch in circumference in the situation described from which blood was flowing in a steady stream. The left leg looked blanched in comparison to the right, and there was no pulsation to be detected in either the posterior tibial, the anterior tibial, or the popliteal artery. The patient showed evidence of considerable shock.

He was taken immediately to the operating room and the external iliac artery exposed above Poupart's ligament and temporary ligation accomplished by means of rubber-covered hemostats. The common femoral artery was then dissected free and it was found that the bullet had practically severed same. An attempt was made to perform anastomosis of this vessel, but it immediately ruptured again on releasing the external iliac, so it was deemed wise to resort to ligation and await the outcome, which was done.

The leg was wrapped in cotton and treated on the expectant plan with the result of losing only the plantar surface of three toes. During convalescence the patient developed ischemic myositis of the calf muscles with a resulting toe drop which was relieved by tenotomy of the tendo Achilles.

The patient was dismissed from the hospital June 18, 1920. He is now in good physical condition and has gained several pounds in weight. Collateral circulation seems adequate and the patient is able to navigate comfortably. Under the circumstances I believe the result is all that could possibly have been expected.

The following table shows the development

of collateral circulation after ligation of the common femoral artery:

Above: With:

Gluteal (from internal iliac);
Deep circumflex (external iliac);
Obturator and sciatic (from internal iliac);
Commissures nervi ischiadici.

Below:

External circumflex from profunda;
Internal circumflex from profunda;
Arteries of ham.

DISCUSSION:

B. F. Zimmerman: I saw this young man shortly after he was admitted to the hospital, and was present when Dr. Ellars operated. The patient was at the time in decided shock from hemorrhage and pain. A few days after the operation he began complaining of numbness and pain in the calf muscles. The foot was elevated, the entire leg wrapped in cotton, hot water bottles applied, and every effort made to maintain circulation and preserve normal temperature. The calf muscles finally became very hard—typical of ischemic myositis—and for a time it was feared amputation of the foot might become necessary. However, no infection developed, the gangrenous areas about the toes remained dry, and the result you have seen. A subsequent tenotomy on the tendo Achilles was necessary to correct the toe drop.

L. W. Frank: I recall having operated during the war upon a soldier who had received a wound below Poupart's ligament severing the common femoral artery near its junction with the deep femoral. Ligation was practiced and the wound closed, the man remaining in the hospital only eight days. He made a perfect recovery without infection or gangrene.

Guy P. Grigsby: During the war many curious shell injuries of the blood vessels were seen. In some instances the femoral vein was entirely divided without damage to the artery. Two cases of this kind occurred in the hospital after signing the armistice where men attempted to unload projectiles for the purpose of making souvenirs of them. These wounds healed promptly without infection and the patients were walking about within a week. Much to my surprise they suffered little discomfort, and there was no edema of the leg at any time.

George A. Hendon: My impression about ligation of large blood vessels is that, in the absence of infection, practically all the patients recover. After ligation of almost any vessel, except terminal vessels, the collateral circulation will promptly assume the burden if infection does not ensue. Gangrene results from pressure of the infectious process. Where infection does not

*Read before the Jefferson County Medical Society.

occur one may ligate with impunity almost any artery below the abdominal aorta.

I recall one instance where the artery was ruptured and was ligated near the junction of the common iliac and the common femoral. Recovery of the patient was uneventful except for slight gangrene of the small toe. In another instance recovery followed destruction of both artery and vein. In six cases I have ligated the common carotid without serious result. Almost any vessel can be successfully ligated provided there is absence of infection.

J. Garland Sherrill: Every surgeon appreciates that collateral circulation is satisfactorily established after ligating an artery for aneurism or injury. In the majority of cases ligation of the common femoral artery near the triangle or in Hunter's canal will prove successful. Occasionally, however, gangrene follows mainly due to the fact that pressure long continued deprives the tissues of proper nourishment. The problem of traumatic surgery is somewhat different from that presented in aneurism. In the latter collateral circulation has already formed because of the presence of the aneurism. In traumatic surgery collateral circulation had not been formed, and where pressure has existed for a considerable length of time there is danger of gangrene developing. I wish Dr. Ellars would state in closing how long a tourniquet was applied before the operation was performed in the case reported. That, in my opinion, is an important feature in dealing with this class of cases. This is especially called to my mind by a case in which the brachial artery was ligated after having been traumatized by a dislocated rib. The tissues had been deprived of blood supply for only about three hours when the operation was performed. The patient later developed ischemic paralysis of the forearm due to deprivation of the tissues of blood for three hours. In cases of this kind the tourniquet ought not to remain applied longer than one hour, because it not only tends to produce gangrene but also subsequent ischemic paralysis.

Another important feature is the prevention of infection. If the femoral artery be ligated and the wound becomes infected, the danger of gangrene is much greater; the danger of gangrene is also increased where the vein is injured.

During the war I saw a man who had an injury of the thigh where hemorrhage persisted and a wide incision demonstrated that the blood came from the femoral vein. This was ligated and the operation nearly completed when it was thought best to examine the femoral artery. It was found that the artery had also been divided but was not bleeding, all the hemorrhage having been from the vein. The femoral artery was also ligated and the patient kept under observation

for several days, but there were no signs of gangrene.

The two main factors in failure of the patient to recover after ligation of blood vessels in this locality are: (a) long application of the tourniquet, and (b) infection. Wounds of the popliteal artery are exceedingly dangerous, and even when ligated the necessary traumatism of surrounding tissues to reach the artery will almost certainly result in gangrene. For this reason in the majority of instances the outcome will not be satisfactory.

L. R. Ellars, closing: This man was in a stuporous condition when admitted to the hospital and no tourniquet had been applied to the leg. No difficulty was experienced in controlling the hemorrhage by pressure while the external iliac was being ligated.

The mortality from ligation of either the common or deep femoral artery is said to be about forty-six per cent. Little can be found concerning this subject in the literature. In most cases infection and gangrene have caused the mortality.

THE OPERATIVE RELIEF OF CONGENITAL PYLORIC STENOSIS.*

By T. DARGAN SMITH, Louisville.

The relative infrequency of which cases of congenital pyloric stenosis are recognized would seem to justify reiteration of a few facts that have not obtained sufficient general recognition. Pylorospasm and hypertrophic growths make pyloric stenosis a borderline disease between the pediatrician and surgeon. It is therefore obvious that the closest cooperation is necessary in the conduct of these cases. A didactic division is usually made into spasm and stenosis. Such a classification has no clinical value. For all practical purposes it is much more satisfactory to use Holt's division into those showing mild or severe symptoms. In fact, Holt goes so far as to state that he is unwilling to admit that pyloric spasm may occur without coexisting tumor and contends that all severe cases should be operated. He considers pyloric spasm as a result and not the cause of the hypertrophic muscular condition. Grossly the tumor consists chiefly of a marked enlargement of the circular muscle fibers of the pylorus.

Dent has observed pyloric stenosis in a seven months' foetus and routine autopsies of infants dying at birth has shown an unanticipated frequency of pyloric tumors. It is likely that in all cases a true malformation is

*Read before the Jefferson County Medical Society.

present from before birth and that the effort put forth by the stomach in forcing food through the narrowed pyloric canal results in enormous gastric dilatation and causes circulatory disturbance, which results in oedema. Oedema exists in a varying degree and is an important factor in determining time of onset of symptoms. Obstruction, of course, results in hyperperistalsis. Hyperperistalsis in turn contributes to the development of the muscular tumor, thus completing a vicious circle, which cannot be continued without the establishment of characteristic symptoms of stenosis.

It has been observed by Albert Strauss that the size of the tumor is proportionate in size to the age of the infant suggesting we are dealing with a progressive affair. Surgical literature, during the past six or eight years, has been crowded with numerous ingenious theories devised to explain the development of these cases. For the sake of completeness, I will mention that Dr. Granville Haynes, of Louisville, believes that chronic infection plays a hand, basing his contention upon observation of hypertrophic enlargement of the sphincter ani muscle.

Pyloric stenosis is frequently incorrectly diagnosed. It is probably most frequently considered as a case of fat indigestion, on account of vomiting, which usually occurs an hour or two after feeding with associated green mucous stools. The earliest symptom is vomiting with increasing frequency and severity until finally it occurs after each nursing and may become projectile in type. This may start any time after birth and the symptoms require a varying period, probably depending on the congenital malformation, to develop to a point where operative interference is required. There is constipation to a degree with green mucous starvation stools. If, after eating, the abdomen of the infant is exposed and carefully watched peristaltic waves may be seen to pass along the course of the stomach. The waves may be observed quite easily, when the stomach contains some milk. They occur at irregular intervals and have appearance as though a rubber ball were rolled across inside the stomach. Holt, who has been a very prolific writer on this subject considers visible peristalsis a pathognomonic sign and is willing to make a diagnosis from it alone.

Downes, of New York, who has probably operated more of these cases than any one else, considers that the palpation of a tumor in the right hypochondrium to be the most important and certain symptom. However, the personal equation of the examiner must be taken into consideration in the palpation of tumors in infants.

The obstruction soon results in starvation with rather rapid emaciation, depending upon the degree of the stenosis. When the infant shows continued loss of weight no time should be lost in relieving the obstruction, for as is well known, the margin of safety in babies is slight indeed and a few days procrastination may result in a fatality. The most certain test is a fluoroscopic examination. This offers an absolute diagnosis in these cases. About one and one-half ounces of barium is mixed up with water or milk and introduced into the stomach through a small tube, such as a catheter, and the stomach observed through the fluoroscope. Characteristic, snake-like peristaltic waves can be observed. It is also best to re-examine the child at the end of five hours and to see if any of the mixture has passed into the duodenum.

In a recent case, which I will show on the screen, no barium whatever had passed the obstruction at the expiration of this period. I would say that any case showing visible peristalsis associated with vomiting, whether or not the tumor is felt, is almost certainly a case of pyloric stenosis. Every such case should be examined by a roentgenologist as soon as is humanly possible, and, if suspicions are confirmed, be operated without delay. Additional improvement in mortality can only be hoped for through earlier diagnosis and prompt operative treatment. The increased safety of the present day methods of treating these cases as compared to the old gastroenterostomy operation has unified the opinion of leading pediatricians to the advisability, and necessity, of immediate operation, once the diagnosis is made.

Rammstedt, in 1913, published an account of his operation, which consists essentially of an incision in the long axis of the canal through the serous and muscular structures, down to the mucosa. When the operation was first advised the danger of injuring the mucosa was only partly appreciated and the means of avoiding such injury as blunt dissection, etc., were gradually evolved through the aggregate experience of a number of operators.

The principle of the operation is quite simple, yet there are a few points in technique, which must be minutely observed to secure favorable results. Lewisohn, of New York, through the performance of a number of these operations and extensive experimentation on dogs has contributed a great deal to our knowledge of the precautions necessary. He has found that if the incision fails to divide any part of the thickened area from the normal portion of the stomach to the duodenum a cure will not be effected. However, if

the incision be carried as much as 1 m.m. beyond the duodenal side, there is grave danger of perforating the duodenum, which is especially thin and undeveloped in these cases. The abdominal incision should be about one inch in length and be made either through the right rectus or median line. The pyloric tumor is drawn up through the incision and may be observed to undergo contractions, appearing alternately as a pink and a lighter fibrous looking mass. Incision approximately one inch in length is made through the outer portion of the muscular coat, and the separation of the muscles is continued down to the mucosa with blunt instruments, since to approach the mucous membrane with cutting instruments exposes one, both to the dangers of incomplete operation and to that of injuring the mucous membrane. A microscopic perforation of the mucosa unobserved at operation will result in fatal peritonitis. Separation should be done beginning at the stomach end, since it is here that the muscle is thickest. Once through the tumor, the mucous membrane bulges into the wound. A line of cleavage may be secured in the submucosa by blunt dissection and additional lumen secured. This was not done in the original Rammstedt operation.

In his early cases, Downes recommended an incision into the stomach followed by the insertion of a metal sound, which was made to pass through the pylorus into the duodenum to be sure he has relieved the obstruction. Several fatalities caused him to discontinue this procedure. I believe the same assurance may be obtained by having someone pass a large catheter down through the oesophagus into the stomach, which the operator may grasp through the stomach wall and very easily test the patency of the canal. In addition to this, the catheter will also serve to remove a large amount of barium, which has been placed in the stomach by the roentgenologist. While this barium is generally conceded to be harmless, yet I much prefer to have it out, since these delicate infants become tedious feeding cases.

Strauss has devised a very intricate method of reinforcing the gastric incision by dissecting up a flap of the tumor and turning it across the incision. This is not deemed necessary by most operators, who have done a large number of these cases and would seem to contribute materially to the danger of injury to the mucosa and to prolongation of the operation. I believe though it is a good plan to protect the incision by suturing a small piece of omental tissue over the gastric incision on the assumption that it will serve the purpose of protecting against possible

slight leakage and prevent the formation of undesirable adhesions. After operation the case merely becomes one for careful feeding. We usually start off with a drachm or two of water, gradually adding a little breast milk, feeding every hour or two, until the end of the third day, when the child may be placed to the mother's breast.

I think it is usually best for the surgeon to share the responsibility in these cases by having a specialist in infant feeding take care of the after treatment.

ADVANTAGES OF THE POTTER-BUCKY DIAPHRAGM IN ROENTGENOGRAPHY*

By D. Y. KETH, Louisville.

Possibly there are a few of you present who are interested in the technic and theory of making good technical roentgen plates. In our brief remarks the discussion will be divided as follows:

- (a) Theory of scattered ray absorption.
- (b) History and development.
- (c) Present results.
- (d) Future possibilities.

Scattered or secondary radiation has always been the worry of the roentgenologist who tries to produce good technical plates.

By scattered rays we mean the rays produced or scattered when the primary x-rays strike the body to be shadowed. These have nothing to do with making the shadow but fog the photographic plate. The longer the exposure the greater the amount of secondary radiation, consequently the more fogging.

In 1913 Bucky conceived the idea of interposing thin metal cylinders of a honey-combed arrangement between the patient and the fluoroscope to get a clearer image fluoroscopically. Later he described a grid arrangement, both of which he called a diaphragm and were to be kept in motion to prevent the metal strips from showing upon the screen.

Potter gave considerable time and experimentation on this theory until he was convinced and could demonstrate that a clearer image could be obtained when the diaphragm was in use between the patient and the fluoroscopic screen.

Potter conceived the idea of absorbing the secondary ray to prevent fogging the silver emulsion on an x-ray film and it is to his untiring efforts we owe its present development. Great difficulty was experienced in preventing the metal strips from showing upon the plate. We now know that if the grid of the

*Read before the Jefferson County Medical Society.

diaphragm stops for any part of a second the metal strips will show and to have an even exposure upon the plate the same number of strips must pass over every portion of the plate to give evenness of contrast and detail. The metal strips are placed five to the inch, interposed in a slit of wood to prevent warping. The metal strips are five-eighths of an inch wide and one-fiftieth of an inch thick and placed five to six to the inch. Their length is two (2) feet, which makes enough space to easily cover a 17 inch x-ray film. The grid of the diaphragm must start moving before the x-ray exposure is started, the exposure being stopped before the grid stops moving. Unless these two points are religiously adhered to, the metal strips of the grid will be present on the roentgen film.

The grid is placed upon a curved metal track so that it may move about five inches; the speed can be regulated to any exposure as it is controlled by a valve in a piston which controls the opening for the passage of oil, the pull being made by either a spring or weights on the opposite side from the oil chamber. The grid must move as much as two inches to prevent the strips from being visible.

It was primarily intended for use of the heavier parts of the body, such as the pelvis and spine, but it seems indispensable in head work. The cumbersomeness of the apparatus has been a disadvantage to its general use but it is believed by many that in the future practically every roentgen laboratory will be using one for most all work including the extremities.

In urinary and biliary calculi its use seems indispensable, as many of the soft stones will undoubtedly show that would not show on films of our old routine work. In other words, many of doubtful shadows will become positive.

The greatest objection in its early use was the length of time of exposure which was thought had to be increased.

Many believe now that such improvements are possible in the fineness of the grid that a clear film free from fog may be produced with a shorter exposure than without the diaphragm, as the fog-producing secondary rays will be absent. Very few, if any, of the films shown you tonight have as much as a ten second exposure.

You will note on some of the films a very clear outline of the soft structures is seen, a definite outline of the kidneys with distinct shadows of the big gut being shown. We hope some day to be able to read most of the shadows seen on excellent roentgen films. At present we believe only a few are attempted to be read.

From our short experience with the diaphragm, we believe the equality of every radiograph is materially increased by its use and feel we will use it more and more.

DISCUSSION:

Robert T. Pirtle: Some time ago a patient came to me from Chicago whom Dr. Potter himself had examined, and brought his plates with him. It was a case of Pott's disease in which I do not believe the diagnosis could have been made so early by the older methods of roentgen-ray examination. The involved portion of the vertebra was not much larger than the end of a finger. The only symptoms present were pain and slight rigidity. The Potter-Bucky diaphragm showed the focus of infection in the vertebra definitely, and the patient afterward developed positive clinical signs of Pott's disease. Had it not been for the Potter-Bucky diaphragm I am sure the diagnosis could not have been made in this case at that stage.

The plates shown by Dr. Keith are wonderful, and after seeing these plates I do not understand how anyone could be satisfied with the older methods particularly in taking lateral views of the spine.

ENCEPHALITIS LETHARGICA*

By SIDNEY J. MYERS, Louisville.

The truth of the ancient adage "there is nothing new under the sun" is exemplified in recrudescence of the clinical syndrome which is popularly known as "sleeping sickness" and medically as "encephalitis lethargica." The affection as at present understood represents nothing new; it was recognized and described with a fair degree of accuracy more than two hundred years ago. The subject was then apparently forgotten by medical writers until during the influenza epidemic of 1890 when lethargy was noted in isolated instances. The meaningless word "nona" was employed at that time to describe the lethargic phenomena.

Technically the designation "sleeping sickness" and "encephalitis lethargica" seem unfortunate. The former is unscientific, and the latter fails to convey the intended meaning, inasmuch as the patient and not the encephalitis is the subject of lethargy. Expressed in the language of a recent author: "Lethargic encephalitis is becoming a sort of junk-heap on which every infection with neural manifestations is being dumped. In the interest of scientific and clinical accuracy, a revision of the nomenclature would indeed be welcome." However, as practically

*Read before the Kentucky State Medical Association, Lexington, September 27, 28, 29, 30, 1920.

everybody now understands what is meant by "encephalitis lethargica" it would probably be well to retain the term rather than attempt to invent another which might be more expressive and at the same time scientifically exact.

In the hundreds of contributions to the literature of encephalitis which have appeared during the last three years every phase of the subject has been discussed, therefore, it cannot be expected this paper will present anything especially new. However, a brief survey of established impressions with commentaries may not be entirely devoid of interest.

Under the evident belief that the affection represents a distinct clinical entity it has been defined as a toxic, infectious, epidemic syndrome, characterized clinically by the triad, lethargy, ocular palsies, and a febrile state; and anatomically by a more or less diffuse encephalitis, most marked in the gray matter of the mid-brain. While this view seems to be held by the majority of authors, in my opinion the disorder cannot be correctly classified as a primary disease, the phenomena exhibited probably being secondary from deposition of toxic (non-specific) material in the cerebral tissues particularly the brain stem and basal ganglia. Why deposition of toxic material in the localities mentioned with production of the syndrome described should occur in one instance and not in ten thousand others under identical circumstances cannot be explained. It is well known that encephalitis with or without lethargy may accompany or follow any systemic disease owing its origin to bacterial invasion; thus, it has been noted in typhoid fever, malaria, bronchopneumonia, diphtheria, variola, influenza, and many other infectious disorders. The presumed relationship between epidemic influenza and encephalitis has been most unwisely exaggerated. Considering the great number of people who suffered from influenza during the two recent epidemics, had there existed any definite relationship between the two affections, certainly many more cases of encephalitis would have been encountered.

The most painstaking and systematic investigations made of the blood, cerebrospinal fluid and other tissues by competent laboratory workers in the attempt to isolate a specific causative agent for encephalitis lethargica, seem to have thus far been unsuccessful. In making this statement I am not unmindful of the value of experimental and clinical work which has been accomplished during the last year or two. For example: one author claims to have isolated from the blood in three cases of severe lethargic encephalitis a gram-positive diplococcus which reproduced in guinea

pigs a fatal disease with torpor, paresis and jerking of muscles, and punctiform hemorrhages in the cerebral gray matter. It is described as a facultative anaerobe and passage through animals seemed to enhance its virulence. Others have reported the findings of a gram-negative diplococcus in the blood of patients with lethargic encephalitis, and from the heart blood in one fatal case.

It is reported from another quarter that a rabbit, inoculated with a filterable virus from the cortex, mid-brain and medulla of a patient with lethargic encephalitis, developed typical lesions in the nervous system which could be reproduced in other rabbits by inoculation in the sciatic nerve or anterior chamber of the eye. Virus from the clinical case did not prove pathogenic for the monkey and guinea pig until after passage through the rabbit; and convalescents' serum had no neutralizing action on it. It is further reported that cultivation of fluid aspirated from the lateral ventricles of the brain in six instances resulted in a uniformly pure culture of a gram-positive non-motile coccus with a tendency to grow in diplococcus and tetrad forms and to bunch in small clusters.

Finally, it has been stated as an established fact that epidemic encephalitis is due to a filterable virus which has been successfully cultivated; that cultures from filtrates of washings from the nasopharyngeal mucosa in fatal cases of epidemic encephalitis injected intracranially into monkeys and rabbits has produced typical clinical and pathologic pictures of the disease; that "a minute filterable organism" was recovered in eleven of seventeen nasopharyngeal washings cultivated, and that cultures of cerebrospinal fluids were positive in fifty per cent of cases.

The average duration of an attack of encephalitis lethargica has been stated as four weeks, but variation is too great to permit of positive statement. The patient may succumb within two days, or the disease may persist for two years and fatality then ensue from exhaustion. The affection is more common in males than in females in the proportion of about two to one; no reasonable explanation can be offered for this disproportion unless it be that males are oftener exposed to infection than females. It may attack individuals of any age from infancy to senility, but is most frequently encountered in young adults. That the malady is not actively contagious is shown by the fact that rarely has more than one case developed in a family even where isolation or individual protection was not applied as a precautionary measure. Several varieties of the affection have been described, but further reference thereto seems unnecessary except to state that obviously

the type will depend upon the cerebral area involved.

The clinical diagnosis ordinarily entails no difficulty to the experienced observer, although resemblance of some of the manifestations to those produced by other affections may cause confusion and delay. Time will not permit extended discussion of the differential diagnosis. Individual observation and study of the antecedent history will enable the attendant to exclude cerebral tumor and abscess, cerebro-spinal lues, sinusitis, botulism, uremia, diabetic coma, etc. Where early symptoms suggest meningitis or poliomyelitis, spinal puncture and examination of the fluid will usually settle the question of diagnosis.

In the majority of instances the following symptoms will be found present in varying degrees of severity: transient temperature, elevation, lassitude, headache, vomiting, vertigo, diplopia, ptosis, choked disc, cranial nerve palsies, general muscular rigidities and disturbed reflex action; the cerebrospinal fluid shows increased pressure on spinal puncture, examination reveals the cell count and globulin content above the normal ratio, otherwise the fluid is negative; the blood examination shows negative findings except increase in urea and slight leucocytosis.

Apathy or somnolence gradually develops usually beginning a week or ten days after onset of symptoms; the patient can be aroused with difficulty; interference with deglutition sometimes occurs, and urinary and fecal incontinence may supervene as lethargy becomes pronounced. Unilateral rhythmic convulsive twitching of the abdominal muscles has been mentioned as an important sign, but seems of doubtful value as it occurs in only a small proportion of cases.

It is noteworthy that in some instances mental confusion, exhalation, delirium with or without hallucinations are the most prominent early manifestations. In such cases lethargy may be absent throughout the entire course of the affection.

The histologic changes have been carefully studied. They may be slight or extensive and are usually confined to the central nervous system, affecting particularly the gray matter at the base of the brain, about the third ventricle, the Sylvian aqueduct, lateral ventricle, optic thalamus, pons and medulla. Rarely has the spinal cord been found involved. The lesions consist of cellular aggregations about the blood vessels, cellular infiltrations in nerve tissues, minute hemorrhages, and edema. "The cellular accumulations and invasions are chiefly mononuclear in nature (lymphocytes, plasma cells, polyblasts); polymorphonuclear cells are also encountered, but are relatively inconspicuous. The lesions them-

selves occur in nodular and in diffuse forms; and those of the tissues are at times clearly associated with the vascular affections and at other times are so extensive as not to be brought into relation with particular vascular involvements. The paralyzes of the ocular, facial and other muscles which sometimes occur arise with rare exceptions from the cellular and other invasions of the nuclei of the corresponding nerves." (Flexner.)

Stated more concisely histological examination of the cerebral tissues reveals the following: (a) vascular congestion, (b) toxic degeneration of nerve cells and neuronophagy, (c) proliferation of mesoblastic cells of vessel walls and infiltration of nervous tissue within the cells, (d) small celled infiltration of the Virchow-Robin space, and (e) glial proliferation.

While the prognosis in general cannot be stated with any degree of positiveness, in mild cases a favorable outcome may be safely predicted, i.e., where the patient can be easily aroused and induced to partake of food, where temperature elevation is inconstant, and where there is no difficulty in either respiration or deglutition. In severe cases, however, attended by profound lethargy, constant temperature elevation, difficulty in respiration and deglutition, a guarded prognosis should always be given. The mortality is stated as between twenty and fifty per cent, death usually occurring from respiratory failure.

Thus far no specific therapy has been evolved, nor is it reasonable to expect such an eventuation, unless a definite causative agent is disclosed by future investigation. Until then the treatment must remain purely symptomatic and empiric. In mild cases the patient should be kept at rest as much as possible, drugs being administered only when required to combat existing symptoms. Hot or cold applications may be useful where the patient is restless and complains of body pains.

In severe cases many methods of treatment have been tried, some proving beneficial, others useless or even harmful. It should not be forgotten that adequate nourishment and careful nursing may be of more importance than the giving of drugs. The production of free catharsis has seemed of benefit in certain cases; the introduction of fluids by hypodermoclysis and intravenously may become necessary because of excessive dehydration; forced feeding and nutritive enemata are often required. Catheterization should if necessary be practiced with sufficient frequency to prevent urocytic over-distension. Where hyperpyrexia is persistent frequent body sponging is indicated; proper attention should be devoted to mouth hygiene.

As to drugs for internal administration:

hexamethylenamin, caffeine, digitalis, atropine, pilocarpine, morphine, epinephrine, jaborandi, and many others have been used with varying degrees of beneficial effect. Certain authors have recommended the intraspinal introduction of convalescents' serum, also intravenous or intramuscular injection of blood from recovered cases. It is said arsphenamin has been administered with disastrous results. Repeated lumbar punctures and withdrawal of small amounts of cerebrospinal fluid have been unproductive of enduring benefit; and blood transfusion has likewise failed to prevent fatality where the procedure has been tried.

From the foregoing survey the conclusions of a recent writer seem warranted:

That the etiology of encephalitis lethargica is conjectural, the diagnosis is uncomplicated, the contagiousness unproven, and the therapy symptomatic.

DISCUSSION:

John J. Moren: Dr. Myers has given you a very good report as to the present status of encephalitis. It remains for me to discuss it from a clinical standpoint.

During the past spring it was my good fortune to see fifteen or eighteen cases of encephalitis, and as far as it being a distinct and separate clinical picture, I want to say to you I have never seen such a clinical manifestation as long as I have been practicing medicine as I saw this last spring. It was different from what we have had before; I am perfectly satisfied of that. Active anterior poliomyelitis prevails in warm weather, while this condition prevails in cold weather, and encephalitis prevails in sections where anterior poliomyelitis has not been reported at all. The pathology is entirely different. The pathology in encephalitis is not degenerative as it is in poliomyelitis. You gentlemen who have seen cases of anterior poliomyelitis know that the paralysis remains and still remains. I have seen these cases of encephalitis with eyes fixed, could not move to the right or to the left, showing involvement not only of the third but fourth and sixth, and one man is getting the use of his eyes today. So the lesion cannot be degenerative because they show a tendency to recover. I have seen these cases recover, so I am satisfied it is not in the same class as anterior poliomyelitis. I am also satisfied it is connected with the grip or infection of some kind. When a patient comes to you with a history of a cold, with a slight rise of temperature, with the grip prevailing at that time, and as the patient gets better of the cold and complains of double vision and goes into a lethargic state and presents all the classical symptoms of encephalitis, it makes you think the connection with the cold. The majority of the cases I saw

this past spring gave a history of having a cold a few days previous to the development of the symptoms. The lethargic type is very clear. We have symptoms of double vision and a lethargy. This lethargy is not a deep sleep at all; the patient can be aroused and answer questions perfectly rationally. That is a classical picture, and in lying in bed these patients do not appear as if in sound sleep, but they lie there as a mass of flesh perfectly quiet, and they remain that way for days and days. All of the cases I saw did not suffer any disturbance in swallowing at all. You could arouse them to give them any nourishment you wanted to.

The most interesting picture is what is described as contraction of the individual muscles. It would seem that any particular muscle of the extremity or abdomen contracts as if you caused it to contract with an electric current. These cases, instead of being associated with lethargy, usually develop delirium, and the three cases I saw had delirium, they had myoclonus or individual muscle contraction, and all developed retention of urine. All three of these cases died.

Those cases that recover from the lethargy and go into the myoclonic stage I have not seen.

Another interesting classification described is the choreic type. Among the first cases I saw was one of the choreic type. I was called to see a girl one night who was supposed to be raving, and I thought I was going to see a case of mania. The girl was 17 years of age, very bright, of nervous temperament, and there she was, lying in bed, rolling from one side to the other, could not keep still, throwing her arms and legs in every direction, and talking like a blue streak about everything. Her case reminded me of the picture of a mild acute mania, not enough to be irrational but simply tossing about. She had a temperature of 100, her pupils were widely dilated, and the pulse was very rapid. It was an unusual picture to me, one I had not seen before. I was satisfied it was not chorea because all the motions were too coarse; they were too wide in their amplitude. I studied that case as well as I could, and within the course of seven days the chorea had disappeared, the temperature went down to normal, and the little girl was left practically exhausted. That is one of the characteristic features of these cases of encephalitis. If they recover, they are literally exhausted.

S. G. Frankel: We are sometimes unable to make a correct diagnosis from the symptoms of lethargic encephalitis. I have seen cases at the City Hospital in Louisville in which we did not have the clinical symptoms pointed out by Dr. Moren and in the paper of Dr. Myers. When we get the classical symptoms in an epidemic the diagnosis is easy, but when we have not an epidemic, and an individual is brought into the hospital in this stupor, we are unable to get a

definite history as to the length of time the patient has been ill or a history of the symptoms, it is sometimes difficult to make a diagnosis of encephalitis lethargica. We are unable sometimes to get the double vision which is suggestive. To my mind the spinal fluid shows the very characteristic of what we have in these conditions. We have to differentiate a patient of this character from one of cerebrospinal syphilis, tubercular meningitis and influenzal encephalitis. If the spinal fluid shows a cell-count of 10 to 20 or 30, shows a positive globulin reaction shows a negative Wassermann, and with negative bacteriological smears or cultures when an epidemic is present, with a few of the classical symptoms given, I think we can make almost a positive diagnosis of this disease. The spinal fluid with the findings I have stated are corroborative of your suspected diagnosis.

With the few cases I have seen at the hospital, I have observed some improvement in the symptoms from repeated spinal puncture. The treatment of these cases is symptomatic. You can do nothing definite as far as medicine is concerned, other than treat the symptoms, and do lumbar punctures at intervals as a therapeutic measure.

Frank H. Clark: I hardly venture to discuss this subject because both of the other speakers have confessed their ignorance on the subject. However, I feel justified in putting before you my own views. There have been some ten or twelve cases of lethargic encephalitis in Lexington, most of which I have seen. There are two or three things I want to speak about.

The essayist and the discussers consider the term lethargic as probably a misnomer. I would raise objection as to the title encephalitis because I have seen cases belonging to this group that were not lethargic. It creates a doubt in my mind whether it was true encephalitis. There are two or three things which will illustrate this if we go back and take our own study of diseases. Let us take pneumonia. You may remember when we divided pneumonia into the catarrhal and bronchopneumonias, and it is still more so with meningitis. We divided it then into the cerebro-spinal meningitis and many others. Now we have a large group of disease among meningitis. This disease of the meninges is very old in a number of respects. There is the development of general symptoms aside from the meningeal symptoms. Practitioners now recognize the fact that meningitis is a general disease rather than an inflammation of the meninges, something like that which occurs in lethargic encephalitis.

There are two characteristics that appear in all of them. One of them is the clearly infective group, having the same characteristics that produce an epidemic of the disease. While we

have a large variety of symptoms, we find it almost impossible to recognize the difference in some cases. Among these have been a small group we have had this winter. All of them differed, yet if you have seen many types you recognize the particular type easily. The findings from spinal puncture and bacteriological examination has been said by the last speaker, namely, you have simply a doubtful condition. You should vary considerably and show very little more than not make a diagnosis from any of these findings, nor can you from any one of the types. When you put them together you will find the picture suggested, although they develop more or less alike. They develop interesting pictures. Dr. Moren referred to a myotonic condition. We had in one of our hospitals two cases of myoclonus connected with it, and the rest an acute infection that same connection there was one patient five myotonia. These two were suggestive, and who, according to the history, slept very deeply for two or three days, and after a number of doctors had seen her a tentative diagnosis of encephalitis lethargica was made, and in less than one week she was back at work. We are dealing with an infection that is varied in its manifestations, possibly varied in the type of infection, as in meningitis and pneumonia, but it is essentially a group infection, and beyond that we know very little. That is plain to any one who has seen a few cases, and especially if he has paid much attention to the literature.

Leon L. Solomon: I wish to add a little to the clinical discussion, without attempting to explain the reason. I rise to emphasize the delirium and mania, that have manifested themselves in five cases, which I was permitted to see, during the last year. In looking over the literature, I have not been impressed by the fact, that other observers have emphasized the mental activity, the confusion, the delirium and the mania which sometimes precede the lethargy, and sometimes succeed it. I have been impressed with the fact, that this probably does not mean a bacterial invasion, but is the result of chemical absorption.

Arthur T. McCormick: I would suggest for the benefit of the country doctors who see very few of these cases, that those who have had more experience in the matter lay some stress on the treatment given after the diagnosis was made, because after all patients and their families are interested in treatment, and those of us who see cases should be much interested in that after we have made the diagnosis.

John J. Moren: It has been my good fortune to see four or five of these cases, which were not recognized, brought to me as possibly nervous children. Absolutely the only symptom left behind was a pupil which is absolutely opposed to the Argyll-Robertson pupil. Instead of loss

of light and retaining accommodation, they have lost accommodation with retention of light. That condition has been present in several of these cases with double vision. Those who did not get double vision did not get this.

So far as medication was concerned it was purely empirical. We gave what we thought was best. I cannot say that any particular drug has any particular effect. These patients grew better from six weeks on. The exhaustion left behind is striking. This little girl I mentioned looks sick today. She looks as if she had passed through a serious illness and suffers from insomnia.

Virgil E. Simpson, closing for Dr. Myers: I can only say as an individual observer that we have here a condition which has been recognized for quite a while, but about which we know as yet very little indeed. I am quite convinced from what I have seen of the few cases that developed in my city, that many cases diagnosed as encephalitis lethargica probably are not such. I am quite convinced also that as yet one means of therapy is just as good as another, and that it is as wise to suggest quinin as hexamethylenamin, or to treat the patient with the latter as with quinin. It is purely a matter of symptomatic management from beginning to end. Until we know more about the pathology of the condition, and until we know more of its causation, treatment must of necessity, as the essayist said, be purely symptomatic and empiric.

Synergistic Colonic Analgesia.—**James T. Gwathmey**, New York (*Journal A. M. A.*, Jan. 22, 1921), introduces another element into colonic anesthesia, which will render expert supervision unnecessary. It is termed synergistic analgesia. At the Presbyterian Hospital it has been definitely determined that the addition of a small amount of magnesium sulphate to the usual hypodermic of morphin increases the value of the hypodermic from 50 to 100 per cent. Gwathmey takes advantage of the knowledge thus gained and converts colonic anesthesia into synergistic colonic analgesia. In other words, he proposes to get a complete brain block by using much smaller amounts of ether than heretofore employed and adding to this effect of ether the synergistic effects of the combined morphin and magnesium sulphate. It will depend entirely on the operation and the patient's mental attitude as to whether or not unconsciousness also shall be induced. A patient under synergistic colonic anesthesia will not be in a third stage anesthesia, but will be analgized and unconscious. The danger of the relaxed tongue, obstructing the airway, will be eliminated, and as the patient will be separated from the danger zone by the second and third stages of anesthesia, expert supervision will be unnecessary.

THE HEART AND ITS CAPACITY FOR WORK—THE GUIDE IN DIAGNOSIS AND TREATMENT*

By H. P. SIGHTS, Paducah.

The heart's capacity for work has been tested in the late war more than any period in the history of man. The great rush in training men for foreign service in the defense of a world's effort for humanity's cause, compelled the unlimited exertion on the part of the personnel of the army. Two million men trained so quickly, and under such strenuous conditions, and for an unusual warfare with its great dangers in getting men to the front, used up the reserve force of the heart and nerves of a large number of men. These hardships prove to us that the heart has a limited reserve force. It is being discovered, among the returning soldiers, that many are crippled more from the loss of the reserve force of the heart than any other functioning part of the body.

Myocarditis has frequently developed in soldiers exposed to the poisonous gases and the unlimited exposures in the trenches. These necessarily should be deducted from the easiness enumerated in considering the heart lesions among the returning soldiers. There is no doubt that the harmony in the heart's cycle has been disturbed in a greater number of cases than has been recognized.

To estimate the exact reserve force of the heart is a difficult task; but it has been taught, by this universal test, that the human race, before this great war, was degenerating physically, and from this lesson it should be learned that the physical development in the future should not be neglected, and the medical profession should assume the task of advocating every healthy exercise that would insure a better physical development of the future generation.

The subject dealt with is description of an organ that indicates the strength and power of resistance in the individual. With a good heart and good nerves, man develops into a powerful machine and need not fear the invasion of ordinary germs or any other element of ordinary destruction. In an ideally perfect man, or woman, the heart is possessed of a certain amount of reserve power to meet the emergencies of life, such as sickness, violent exertion, injury, shock to the nerves and over-excitement. Unless the continued demand on this reserve power is too great, there is no harm resulting from the overtaxed use

*Read before the Kentucky State Medical Association. Lexington, September 27, 28, 29, 30, 1920.

of this organ. However, through vocational habits and indulgences that abuse the heart, and vice that impairs its function, destroying the reserve force, the organ is robbed of its surplus energy and is thereby crippled. Man often, by his own recklessness, robs his heart of the reserve force so badly needed at times, and comes to grief in emergency. To illustrate: The nerve centers have set an index for a certain number of heart beats per minute in accordance with the muscular power of the organ, and if the nerve force is normal, this may be increased fifty (50) per cent without harm to the heart. In case of great physical exertion, fever, and under great excitement, the degenerated individual, whose physical powers may be robbed of all normal reserve, either by himself or his ancestors, will under such strain become an invalid with conditions such as will be described later on in this paper.

In determining these different complications in lost function of the heart, we should have a picture in our mind of the heart's capacity for work, and with a practical consideration of the organ, its position and relation to the other organs of the body, its dependence on them for certain aid in performing its work, one is able to determine the pathological condition when it exists, on examination. To do this, it is necessary to consider the anatomical structure and nerve control, for the individual has no control over the heart by will power. With these facts as a base, the force of control should first be understood, that being an arbitrary system of action controlled by a set of nerves that work automatically and without rest, except momentarily. When the heart rests for an unusual period it means disaster to the other organs of the body. It is wonderful that an organ is wound up, so to speak, for eighty or ninety years, never missing a beat and acting seventy or eighty times a minute with no dictation of the will of man to disturb it; yet it is oftentimes abused and imposed upon by the habits of our lives. When one inquires about the work it is doing to ascertain the end and significance of certain signs and symptoms, in other words, when its cry for help is listened to, we realize the bearings such signs and symptoms have on the circulation, whether foreshadowing heart failure or indicating its immediate presence. First, its ability to maintain an efficient circulation is questioned, and if satisfied that it is able to maintain its laborious work, the thing is looked for that disturbs its regularity, alters its sounds or increases its number of beats.

The heart's capacity for work is an undiscovered secret of nature's wonders, and is as

varied as the different facial expressions of man. There is hardly an adjective that has not been used to describe the heart of man, yet its reserve powers cannot be accurately estimated. We know the reserve capacity of the lungs and know the limitations of the other organs of the body. Statements such as, "If the heart holds out he will pull through," is often made in connection with disease. The end of the scene is heart failure.

The heart muscles have two forces: The Rest Force—that force that maintains the efficient circulation when the body is at rest, then additional force that is called into action when effort is made, termed the Reserve Force. This reserve is called on when the body is called to make some effort while it is at rest. The physiologist has not given it that study its importance demands. The functional efficiency of the heart depends on the amount of this reserve force. Any disturbance of circulation calls for adjustments to meet the demand on the heart, and necessitates increased effort on the part of the heart's muscles, which is made on the reserve force, and if persisted in leads sooner or later to its exhaustion. Any endeavor to find some standard by which the amount of reserve force may be estimated seems to fail, for it is found that, in healthy individuals, the reserve force is subject to great variance, and that the power possessed by the heart of increasing the efficiency of its function by systematic and judicious exercise is demonstrated. Conversely, the neglect of healthy exercise leads to speedy exhaustion as found in individuals who lead sedentary lives. So the only standard of measuring the reserve is in the main, personal.

This leads us up to the other phase of the subject—"The Guide in Diagnosis and Treatment" of all disturbances of this organ, namely exhaustion of the heart's muscles, valvular lesions, heart block, diseases of the heart's muscles, or myocardium, auricular fibrillation, abnormal rhythms, etc. In order to determine these various pathological conditions and organic changes it is necessary to have a correct interpretation of the cardiac cycle, as it would be impossible, without this knowledge, to determine the exact diagnosis. It is understood that, for a basis of study, the following divisions of the cycle is attempted as correct: The cycle lasts a period of eight-tenths of a second. One-tenth of this period is the auricular contraction; three-tenths the ventricular contraction; four-tenths the diastole.

Acceleration of the cardiac contraction affects the diastole, cutting down the period of rest. From this observation of the normal

cardiac impulses, a study can be made, with some degree of accuracy, of the various automatic rhythmicity of the heart sounds and its arrhythmia determined at once and estimates of the degree of heart block. The .4 of a second's rest of all the four chambers when encroached upon by acceleration of the heart's rhythm measures the amount of heart block as follows: Increased beat of the auricular contraction; failure of the stimuli arising from the auricular ventricular bundle passing to the ventricle walls preventing the contraction of the ventricle; lowering the number of beats of the ventricle.

Disturbing the harmony of the cycle, the degree of heart block can be ascertained as follows: If the nerve impulse causing the contraction of the auricle fails to pass to the ventricle, say alternately permitting the registration of two contractions of the auricle to one of the ventricle, there would be fifty per cent heart block, or there would be 150 auricular contractions to 75 ventricle contractions; then an increased contraction of the auricle over the ventricle would be auricular fibrillation.

The normal heart sounds, thoroughly understood, are of great advantage in the interpretation of any disturbance resulting from valvular injury, or inefficiency. The periods of systole and diastole, as described above, form an accurate basis for the interpretation of different adventitious sounds that indicate valvular disturbance which are endocardial. We may find a friction sound—roughness of the pericardium, or the sound produced by fluid in the pericardial sack, that may be heard and recognized during this period. In diastole we also discover adventitious sounds arising from valvular obstructions or incompetency. The accuracy of determining the valves involved and murmurs, or bruit, depends upon the knowledge of the time and contraction of the valves relative to the first and second sound of the heart, and the direction of the sound that are carried by the current of the blood.

The determination of organic, or functional murmurs, is essential, and we are aided in the different diagnoses by the valvular murmur from certain areas indicating certain sets of valves. It is a fact that no obstructive murmur is a functional one, such as the aortic stenosis, mitral stenosis, etc.

Clinically, the patient stands for inspection. First, the chest pulsation is observed, embarrassment of respiration, locating the apex beat, outline the size of the heart itself by careful percussion, then percuss the area of the large blood vessels at the base of the heart, then the auscultation, determine whether or not

there is present adventitious sounds, and decide whether they are systolic, pre-systolic or diastolic. The superior cardiac vascular area, extending from the clavicle to the base of the heart rectangular, bounded on the either side by the ventricle line extending from the base of the heart—right and left extremities, contains superior venocava, aortic arch, the innominate artery and veins. Highest point of aortic arch is about one inch below the super sternal notch about the middle of the manubrium. Pulmonary arteries lie beneath the left second costal cartilage. Valvular areas are as follows. Flattened circle from the upper border of the third left to the sixth right rib across the sternum obliquely. Above downward the valves lie in the following order: the pulmonic at the upper border of the third left chondro sternal joint; aortic beneath the left half of the sternum at the lower border of the third costal cartilage; mitral area beneath the left half of the sternum at the level of the fourth costal cartilage; tricuspid extends from mid-sternum at level of the fourth costal cartilage to the fifth right chondro sternal junction.

It is an accepted principle in locating the auscultatory valve areas to observe the following points where the heart sounds can be best heard. The mitral area is indicated by a circle about an inch in diameter, centered at the cardiac apex. The tricuspid area overlies the lower end and right half of the sternum from the fourth to the sixth or seventh costal cartilage. The aortic area is situated at the sternal end of the second right intercostal space and costal cartilage. Pulmonic area is at the sternal end of the second left intercostal space.

The first difficulty met in diagnosis of heart lesions is determining the different valvular lesions of the heart and one meets with a difficulty which he is compelled to overcome, in making a survey preparatory to diagnosing the valvular lesions. To determine the valves involved and decide the character of lesion producing the different valvular sounds that are discovered, a careful consideration of all of the suggestions previously made is necessary. A mitral murmur, systolic in character, may indicate a mitral insufficiency or a functional murmur without organic changes; a pre-systolic murmur, if heard over the mitral area, would indicate a mitral stenosis, or roughening of the mitral valve. The same careful interrogation would determine over the aortic valve area a systolic murmur from a stenosis of the aortic valve. Beneath this same area, the diastolic murmur is heard and aortic insufficiency would be diagnosed. The valves of the right heart, when giving out

murmurs over the areas described above, can be determined in the same manner as the contraction of the right heart in the cardiac cycle covers the same period, and diastole is the same. The differential diagnosis in lesions of these valves can be determined by close attention to the valve area, and auscultatory area during the cardiac cycle. The pathological condition that is responsible for these disturbances of the harmony of the heart's sounds are numerous: Rheumatism, infected tonsils, bad teeth, infection of sinuses of the face, streptococcus infections, etc.

Myocarditis, as we understand, is an inflammation of the heart's muscles and may produce various changes in the heart that results in disturbances of the valves which may give rise to certain heart's sounds indicating serious disturbance of the functions of this organ.

The diseases are so numerous that affects the heart and disturbs the cardiac cycle, it is impossible to treat them in one paper. The treatment of these various heart lesions should be indicated by the careful finding after a thorough survey has been made of the disturbance of the heart's action, and an interpretation of its murmurs and the extent of pathological changes occurring. We have a number of remedies that are universally resorted to in practically all heart affections, namely, digitalis, strophanthus, nitroglycerine, strychnine, caffeine and camphor, any one of which in the hands of an unskilled and careless physician is potent of great danger; but in the hands of a skillful diagnostician are very beneficial in the handling of these disturbances of the heart. The action of digitalis alone, and its proper use in cases of different heart lesions, if discussed, would require a greater period of time than has been allotted to this paper.

The irregular heart action is of importance and a knowledge of its mechanism is essential when administering digitalis, as also is the knowledge of the action of the drug on the nerves and tissues, if the proper result of the drug is expected. There is no doubt that in many cases lives have been saved by the use of this drug, in reducing the pulse rate, and restoring the regularity, in cases of auricular fibrillation. There is a great diversity of opinion in regard to the form of digitalis and dosage given.

It has been my experience that many of the products of this drug have proven unreliable, in fact there are only two products I have considered absolutely trustworthy, they are the fat-free tincture, administered internally, and digoparatum in veins.

The first duty in the use of this drug is to

ascertain what circumstances and conditions have induced the heart disturbance.

Treatment other than drugs, that is found to be efficacious, are as follows:

Rest; diet; judicious exercises; massage; ice packs on chest; various baths; spar treatment; sea bathing.

In conclusion, I would like to say, in presenting this subject, I have endeavored to give a word picture of some of the important views in the interpretations of the heart's capacity for work, and the changes due to various diseases and abuses of this wonderful organ in its independent activities in the course of the life of man.

- DISCUSSION:

John Rowan Morrison, Louisville: I am sorry Dr. Sights did not have time to finish his paper, as it was not made clear what he would have gotten at.

This is a very important subject, and there have been many ways of determining how the heart works. In a book on clinical diagnosis which was published several years ago it was determined in the physiological laboratory that the strength of a healthy heart of a large dog could be made efficient under a certain amount of work; that you could increase the rate by work up to six times the original rate and three times the pressure. With a healthy human heart you could probably not do that.

We have had various schools of medicine, and it has been said that we could determine something about the capacity of the heart by taking the blood pressure, having the patient lying down and standing up, and sitting down, and taking the different pressures and different rates of the heart, although Dr. MacKenzie says he has never been able to accomplish very much by this. Many men seem to think they can determine if a patient is weak or not by it. MacKenzie has a method of finding out whether the heart is efficient or not, and it is this: We know when a heart has been overcome we have dyspnea, cyanosis, and a tendency to dropsy. He says that if a patient develops these symptoms of dyspnea and cyanosis, it gives us a good idea of what the heart is able to do. A man may go up a long flight of steps this year and does it with only a slight puff, but his heart is being affected. If next year that man takes a short flight of steps and his dyspnea is marked and there is considerable lividity, it is an indication that the heart is considerably involved. Those are probably the real fundamental ways we have of determining the efficiency of the heart muscle.

In the examinations for the army we tried these exercise tests, and through them we largely determined, not so much the heart efficiency as whether the patient had an effort syndrome or

not, but we could not tell so much about the efficiency of the heart.

Dr. Sights spoke about cardiac efficiency, first determining it by the newer methods, whether the patient has heart block, auricular fibrillation, or auricular flutter, and things of that sort.

I was interested in reading an article in last week's issue of the *Journal of the American Medical Association* by Dr. Levin, of Boston, in which in some surgical cases the heart was supposed to be acutely dilated. Investigation showed that in some of them there was simply auricular tachycardia, and in some cases we have a rate sometimes of 170 and 200. If there had been auricular flutter they would have had 200 or the multiple of that. The heart would be going out of bounds. In these cases of auricular tachycardia and other cases the diagnosis of auricular fibrillation is made at the bedside. If you find a heart at all fast, with constantly irregular pulse, we should look out for auricular fibrillation, if you find there is a deficit between the pulse rate and the apex beat you will find, for instance, as I did yesterday afternoon, 96 at the pulse and 112 at the apex, the patient cyanotic, with no irregularity in the strength of the rhythm. In such a case you have strong evidence of auricular fibrillation.

Charles G. Daugherty, Paris: I am sure, we all enjoyed this paper, but we have gotten into a region in which it is difficult for us to know what we are talking about. I am quite sure, when we come to determine the heart power, to know what we are dealing with, what we are going to do in the way of treatment, we have to call into usage all of our instruments of the present day, the polygraph, the electrocardiograph, and a number of other instruments we have at our command in order to determine whether we are dealing with an organic condition of the heart or not.

I recall several years ago seeing a patient who had symptoms of organic heart disease, and on slight exertion would get out of breath. Estimation with the polygraph showed there was no fault whatever with the formation of the sounds and the formation of waves as shown by the tracings. That patient had a cusp condition and tachycardia that was purely temporary, and to attempt to treat that case by digitalis or other agents would have been a failure. We have to use a great many of these methods in order to make a correct diagnosis.

As to the determination of possible heart power, these cases will come within the range of a purely scientific affair, and not with the methods we have to deal with in practice. What we wish to know generally is the trouble the patient is suffering from and to deal with the patient as an applicant for service in the army or something of that kind. A method adopted in Eng-

land by Lewis was to drill men and observe them to see whether or not they had an organic lesion, to see whether their heart could stand the work, or whether these men were feigning or not.

With reference to what power the heart has, we have to deal with these cases in the treatment of pneumonia and febrile diseases of various sorts, and the question comes up, how much stimulation the heart can stand. Most of us have found that practically we do not run a great deal of risk in giving stimulation if we use ordinary good sense.

The danger is in appearing to give enough stimulation to carry the patient through a given disease.

I recall a patient during the past winter who had a severe pneumonia involving both lungs, who had a heart lesion to start out with, with Cheyne-Stokes breathing from Bright's disease, and an intercurrent lobular pneumonia. We had no fear of giving that man stimulation. He is alive and is practicing medicine today. He is in better shape than he was when taken with his illness—influenza.

The range of this paper might have fully gone into the matter of how we know whether the heart is performing its function regularly or not, and what signs to look for. We know the ordinary signs of exertion are dyspnea, and following that later we have signs of edema of the lungs, or signs of dilatation with increased area of the heart beat. These are the first signs that the heart power is not what it should be; in other words, symptoms of decompensation, and I am quite certain not frequently enough do we bear in mind the finding of the edema about the base of the lung, which is the first sign we have that the heart is not doing its work right. The patient may seem all right. We may stimulate him long enough so that the pulse may seem to be good, and the circulation may be all right, but only a short time after that do we think of the things that occur, proving that these signs of early edema in the base of the lung are the real indication that the heart is not performing its function properly, and we have a damming back of the cavities of the heart, from the liver, intestine, showing hemorrhages, edema, of the ankles, etc.

In the matter of treatment, if the patient had been quiet, all of us would have subscribed to the findings of Mackenzie. One thing we should rely on is digitalis. In relying on that we should rely on a good preparation. I do not wish to mention one firm to the detriment of others, but we should stand by that firm that puts out a good preparation, so that when you know you can give digitalis, you can give a preparation on which you can depend.

Leon L. Solomon, Louisville: I regret that my

friend and classmate, Dr. Sights was not permitted to finish his paper. It is difficult to finish the reading of a modern day scientific paper in fifteen minutes. I would rather see fewer good papers on a programme, the essayists, allotted twenty minutes in which to read them, than a larger number of possibly poorer quality essays, written to be read in fifteen minutes. If the doctor had been given five minutes more, I think he would have recalled the statement of our late lamented and much beloved teacher, Ouchterlony, when he said, that, given a good muscular system and a good nervous system, we can, as a rule, promise with reasonable accuracy, a recovery, in times of direst cardiac distress. Heart power is to be considered, not only in terms of strength of heart muscle, but also from the standpoint of the condition of the nervous system—I sometimes think Mr. Ford is right, when he continues to manufacture a four-cylinder car, refusing to change to the popular six or multiple of six; I have heard him quoted, as saying “he might some day build an eight cylinder car or a multiple of the eight.” The four-cylinder of the Maker of us all depends for its power on the size and strength of its ventricles, (cylinders) and, as just stated, on its innervation, viz., its “ignition system.” I differ with my friend Dr. Morrison in his comparison between the dog heart and the human heart. I believe man’s heart has infinitely more power than the dog’s heart. Surely, the human heart is possessed of a greater redundancy of power, than that of other animals. Those of us who lead sedentary lives, engaged in active medical practice, because we do not climb stairs, but use elevators, and, because we go, from place to place, in automobiles and never walk, soon discover, that, in running after a street car or in climbing up one flight of stairs, not even two flights, we are embarrassed for breath. Within a few days, provided we have a good muscular system and a sound nervous system, we can reclaim our heart strength by climbing one or two flights of stairs. I have been such a sufferer; I have tried the remedy and can vouch for its effect. I think, more frequently, heart recovery is dependent upon nerve strength than upon muscle strength. As a result of intoxication, a heart, whose muscle was good, does badly, because the nervous system suffers from the intoxication. We see this in the young man, who is habituated to excesses—cigarettes and other excesses. When put to the test, by acute illness, such patient succumbs, whereas the next sufferer, not so weakened, recovers, because of his good nervous system and his good muscular system.

Virgil E. Simpson, Louisville: It is agreed that it is very necessary to make use of every means available to not only make a diagnosis but to estimate as accurately as possible the capacity

of the heart for work also, for it is upon this latter phase that one must determine whether treatment is necessary and if so what is indicated.

There are a number of methods that are of assistance in making determinations of the heart capacity but I shall refer to but one and that is the electrocardiograph or even a polygraph but without any attempt to make comparative estimates of its value as compared with others. It is the practical that interests the busy doctor. All of them do not possess an electrocardiograph or even a polygraph but every doctor can possess and use intelligently a blood pressure apparatus. It can be used at the office or in the home equally well and with but little annoyance in transportation thanks to the manufacturers. To make these readings of any value during the observation of any case, a record of the date and findings should be kept so that comparisons may be made from time to time. I find the use of a graphic chart which may be obtained from some of the manufacturers at a very small expense is a desirable method of keeping the records. While it is helpful to keep a record of the systolic and diastolic readings only, yet much more valuable information can be obtained from them if carried further. The chart should show the pulse rate, the systolic, diastolic, pulse and mean pressures as well as the heart load, the heart work and velocity. In order to determine the reserve capacity of the heart it will be found exceedingly helpful to make the record show these readings at rest, immediately after exercise and after a five-minute rest period. A clear understanding of what the various readings mean is essential to a correct interpretation of heart status. The term systolic pressure is used to represent the total amount of energy expended by the heart during each contraction; the diastolic pressure means the amount of stress which the cardiovascular system sustains at rest; the pulse pressure, which is the difference between the systolic and the diastolic pressures, represents the degree of resistance that is overcome at each contraction of the heart while the mean pressure, which is obtained by dividing the total of the systolic and diastolic pressures by two, represents the total strain to which the cardiovascular system is put. In addition to these determinations it will be found helpful to determine the heart load. This is obtained by dividing the pulse pressure by the diastolic pressure. Fifty per cent represents the normal heart load and more than this is called an overload.

To illustrate the deductions that may be drawn from such readings which may be helpful in estimating the need for therapy let us take hypothetical readings from a case of aortic regur-

gitation and one from a case of interstitial nephritis:

	Aortic Regurgitation	Interstitial Nephritis
Systolic pressure	200	200
Diastolic pressure	70	120
Pulse pressure	130	80
Mean pressure	135	160
Heart load	185%	66%
Pulse rate	90	70
Heart velocity	11700	5600
Heart work	18000	14000

An analysis of these readings show that in the case of the aortic regurgitation there is a high pulse pressure and a tremendous overload of 135 per cent, while in the case of the nephritic condition there is a much lower pulse pressure and an overload of but 16 per cent. In the latter condition the heart is doing its work fairly satisfactorily and there is little need for therapy so far as the heart muscle is concerned while in the former the heart is in greater distress.

The normal ratio of the systolic to the diastolic pressure is represented by the formula: S. P., : D. P., : : 3 : 2., while that between the systolic and pulse pressures by the formula: P. P., : S. P., : : 1 : 3. The ratio between heart work and heart velocity is: Vel., : Wk., : : 1 : 3.

H. P. Sights, closing discussion: I wish to thank Dr. Simpson for finishing this paper in his discussion on the cardiovascular action of the heart, and interpretation, as this was really the climax of the paper, and I regret very much the limited time preventing me completing the paper, as the part of the paper read, was merely the foundation for the remainder of the paper for discussion.

I also thank Dr. Solomon and others who discussed this paper and threw the light on it they did. I consider this one of the most important subjects, pertaining to the disability of man, and unfortunately the medical profession is somewhat lacking in the knowledge of the function of this organ, that is necessary for the proper interpretation of the various disturbances that it is subject to.

Semilunar Cartilages After Trauma.—Terracel and Colaneri injected air directly into the knee joint on suspicion of injury of a semilunar cartilage, and give illustrations showing the characteristic radioscopic findings with separation of the internal or external meniscus. There is a white line that looks as if made with a finger nail, cutting the meniscus. The discovery of this verifies the clinical findings and establishes the diagnosis and treatment.

DIAGNOSIS, PROGNOSIS AND TREATMENT OF SYPHILIS*

By HERBERT BRONNER, Louisville.

The history of medicine will probably not disclose any one disease in which there have been so many epoch-making discoveries as have occurred during less than two decades in the case of syphilis. It might not be amiss to briefly review the most important of these great discoveries in a paper dealing with the diagnosis, prognosis and treatment of syphilis.

The inoculation experiments on certain varieties of monkeys were made by Metchnikoff and Roux in 1903. These experiments were followed by the prophylactic use of thirty-three-and-one-third calomel ointment. In 1905 came the discovery of the treponema pallidum by Schaudinn and Hoffman. In 1906 came the Wassermann reaction. In 1910 came the discovery of salvarsan by Ehrlich and Hata. In 1911 came the cultivation of the treponema by Noguchi. In 1913 came the discovery of the treponema in the brain of paretics and in the spinal cords of tabetics by Noguchi and Moore thus forever placing these conditions where they really belonged instead of being called parasymphilitic diseases. Other discoveries which might be mentioned were the search for the treponema by the dark field illuminator, the examination of the spinal fluid in the diagnosis of spinal lues and Lange's colloidal gold test. Truly a wonderful series of discoveries and one which has revolutionized our ideas about the diagnosis, prognosis and treatment of syphilis.

A goodly number of us who are here today were taught that before treating a case of syphilis that the secondary eruption must be awaited. Today we not only know that this teaching was fallacious but we know that if the secondaries are awaited that the "golden opportunity" for the treatment of the disease has been lost. It must be remembered that the treponema pallidum is a highly motile organism and becomes very active as soon as inoculation takes place. To such an extent is this true that Neisser proved that the organism has been found in the lymph glands, spleen and marrow of long bones even before the appearance of the chancre, thus showing the fallacy of excision of the chancre as a therapeutic measure.

Our aim today is to make the diagnosis as soon as possible and therefore, whenever possible, before the Wassermann has become posi-

*Read before the Kentucky State Medical Association, Lexington, September 27, 28, 29, 30, 1920.

tive, at which time the organism has become disseminated throughout the body by means of the blood stream. This early diagnosis of syphilis has been made possible by the intelligent use of the dark field illuminator on all suspicious lesions.

We will not dwell on the India ink or the staining methods for the determination of the treponema in lesions because these measures are now known to be far inferior to the dark field illuminator. If a chancre has not been treated by strong applications such as silver nitrate, mercurials, etc., the search for the treponema should be successful in a large percentage of cases. This brings us to an important point—no suspicious lesions should have strong applications made until a thorough search has been undertaken. Nothing stronger than saline solution or a bland application of some type. Even if strong applications have been made, if saline solution is applied for twenty-four to forty-eight hours and serum is obtained from the base of the lesion the treponema may be found.

We have stated that all genital lesions must be looked upon with suspicion. This is especially so since the chancre may vary so in its type and not always be the so-called Hunterian type of chancre. Again, we see cases of mixed infection, that is, chancroid and syphilis. No case of chancroid should be dismissed without a search for the treponema and even if negative should be watched later by means of the Wassermann test.

That the initial lesion may be a very trivial affair is proven by a case of Fordyce's in which he demonstrated the treponema in a papule of twenty-four hours' duration. While every genital lesion should be looked upon with suspicion we believe that the other extreme can be reached. We know that certain dermatoses may exist on the penis and a trained dermatologist can early recognize these lesions, emphasizing the fact that a knowledge of dermatology is of great aid to the syphilologist. For example, we have seen the itch burrow wrongly diagnosed as chancre. Here the history of the case, the presence of the itching eruption on the typical locations should help to make the differential diagnosis. We have seen lichen planus on the penis mis-diagnosed. Herpes progenitalis may sometimes be difficult to differentiate from the so-called multiple herpetiform chancre. In the former, however, there is usually a history of repeated attacks of vesicles on an inflamed base accompanied by itching and burning and minus the glandular enlargement and minus the treponema.

Klauder has shown that the percentage of positive findings of treponema by the dark

field is high up to the tenth day after which time the curve drops. In his series in thirty-three chancres examined within ten days of their appearance, the dark field was positive in thirty-one cases, or 93.9 per cent. In seventeen chancres examined within from ten to twenty days of their appearance the dark field was positive in nine cases, or 52.9 per cent. In twenty chancres examined within from twenty to thirty days of their appearance, the dark field was positive in ten cases or 50 per cent. In forty chancres examined after forty days of their appearance the dark field was positive in twelve cases, or 30 per cent. Some of the cases had been seen earlier or had not strong applications been made.

We wish to reiterate that the ideal diagnosis is the positive treponema with a negative Wassermann. But suppose that a suspicious lesion is seen and for some reason the treponema cannot be discovered. How much assistance is afforded us then in making a positive diagnosis of lues by means of the Wassermann test before the appearance of the secondaries?

Col. Craig, of the U. S. army, one of the country's greatest authorities on the Wassermann reaction gives the following statistics on positive findings:

Week after appearance of chancre	Total Cases	Positive	Per Cent	Negative	Per Cent
1st wk.	77	27	36.3	50	64.9
2nd wk.	155	92	59.3	63	40.3
3rd wk.	158	109	68.9	49	31.0
4th wk.	167	129	77.2	38	22.7
5th wk.	43	35	81.3	8	18.6

Klauder in a series of cases at Camp Upton gave the following figures:

Duration of chancre in days	Number of cases	Positive	Per Cent
One to ten	33	12	36.0
Ten to twenty	17	11	64.7
Twenty to thirty	20	14	70.0

A study of these statistics shows that the percentage of positive findings increases rapidly after the second week, an inverse condition to the positive findings of the treponema. We wish to state that we have not been able to obtain as high a percentage of positive findings in the first week as Craig reports but that our experience likewise shows that after the second week the number of positive findings begins to increase rapidly.

As Craig states the Wassermann test is far more useful in making or confirming the diagnosis in the primary stage than a great many men would have us believe, at least ninety per cent. It might not be amiss to say a

few words about the Wassermann from the clinician's standpoint. Of course, no laboratory test is infallible but the Wassermann test stands today probably the most accurate laboratory procedure we use, that is, when made by a competent man, and the worth of a Wassermann depends largely on who makes it. The margin of error in the hands of the best men in the world is less than .5 per cent. This small number of positive Wassermanns is obtained in yaws, leprosy, relapsing fever and in malaria at times during the febrile stage. What laboratory procedure has as good a record?

We wish to mention the provocative Wassermann test as a possible means of early diagnosis. We know that as great a syphilologist as Pollitzer does not approve of the procedure, while Stokes believes that the therapeutic test is better than a provocative Wassermann. Personally, we have used the provocative Wassermann to advantage in a number of cases. The test is made by giving the patient an injection of salvarsan and then taking the blood in twenty-four hours. In some cases where the blood has been decidedly negative we have obtained a positive reaction after the provocative injection. If the blood is negative after twenty-four hours the blood should again be taken at forty-eight hour intervals for several days and the tests made.

It can readily be seen that laboratory procedures including the dark field illuminator or the Wassermann test will make or confirm the diagnosis of syphilis in the primary stage in over ninety per cent of cases.

There is one condition that may arise which should be mentioned. A patient has a genital lesion in which the treponema cannot be found; also the Wassermann is negative; yet this lesion is clinically a chancre. What is to be our position? We agree with Klauder that our clinical experience should be taken in such cases and not wait possibly a number of days to obtain a positive Wassermann. In other words, while having the highest respect for laboratory procedures, a man with large clinical experience will recognize certain types of chancres and therefrom gain time in the fight against the foe.

Of course, if the secondary stage has been reached when the patient is first seen there should be no difficulty in diagnosis. For not only are the clinical findings sufficient upon which to base a diagnosis but if there be any doubt the Wassermann reaction will be found positive in at least ninety-five per cent of cases.

In this paper we have dwelt on the diagnosis of primary syphilis because we felt that an attempt to cover the various stages would

carry us too far afield and also because we thought that the special phases such as neurosyphilis, syphilis of the eye, etc. would be touched on by others.

The question of the prognosis of syphilis is one that has to be considered from the standpoint of the pathologist and the clinician.

The work of pathologists especially the splendid autopsy work of Warthin has thrown some very interesting light on syphilis. Warthin showed that in a study of seven hundred autopsies at Ann Arbor that forty per cent showed evidence of syphilis. This percentage is higher than that of other autopsy records but the reason is obvious. Previous investigators had depended almost solely on gross pathology to make a diagnosis. Warthin showed the fallacy of this by demonstrating the constant presence of a definite pathological entity in leucic patients. His statement is "The new pathology of syphilis is based upon the demonstration that the essential tissue lesion of either late or latent syphilis is an irritative or inflammatory process usually mild in degree characterized by lymphocytic and plasma-cell infiltrations in the stroma particularly about the blood vessels and lymphatics, slight tissue proliferation, eventually fibrosis and atrophy or degeneration of the parenchyma. These mild inflammatory reactions are due to the localization in the tissues of relatively avirulent spirochetes."

It is interesting to note in what organs these changes were found. Chronic myocarditis was commonly found. Lesions of the blood vessels were likewise common. Aortitis, aortic aneurysm, aortic insufficiency, diseases of the coronary arteries, of the vessels of the brain were found frequently. The pancreas, the adrenals, the kidney, the liver, and in the male the testicle showed frequent involvement. Not only did Warthin show pathological changes in these organs but after much painstaking effort he demonstrated the treponema by Levaditis' method.

Warthin's most startling statement, however is that he never saw a pathologically cured case of syphilis and this statement held good whether the patient had little, much or no treatment. We will let Warthin speak for himself: "As to curability I have never seen, pathologically a cured case of syphilis. In all cases examined at autopsy active areas of specific inflammation are always seen and such areas mean always the persistence of the spirochete. Perhaps these intratissue parasites should in cases without symptoms and negative Wassermann reaction be regarded in the same light as that in which we look upon the streptococci of the mouth cavity. Does the

spirochete cease to be a cause of disease and the body become a carrier of relatively or even quite completely harmless organisms? That some progressive injury is being caused is demonstrated conclusively by these studies. Immunity to the spirochete pallida and probably to all other organisms that enter the body tissues or, perhaps even its passages and cavities, is paid for with a price—the price of defense. The infiltration of lymphocytes and plasma cells in themselves may cause damage—infinitesimal, perhaps, but where persistent over a period of years may finally produce functional disturbances. The persistent slight damage and necessary repair by fibroblastic proliferation and the eventual fibrosis explains the latent period of syphilis and the final outcome in such terminal conditions as aortitis, myocarditis, pancreatitis, etc. The majority of cases of syphilitic infection die from the results of these slow mild inflammatory processes in the viscera and blood vessels rather than from paresis or tabes. I am convinced that the great majority of all cases infected with syphilis die of chronic myocarditis.

The syphilitic is pathologically “damaged goods;” and the damage is a progressive one. He wears out sooner, his viscera more quickly reach their histogenetic limits; he actually becomes prematurely old and there is a constant strain upon his defensive powers. No man can acquire syphilis, become clinically cured, which as far as we know means latency of the infection, that is, spirochete carrying and have the same potential body-value and expectancy of life as before the infection.”

Not a particularly encouraging statement. We wonder, however, if the patients treated today when a diagnosis is made early and when intensive treatment is given, would show these pathological changes.

Under the head of prognosis we must consider the subject of morbidity. Leredde estimates that syphilis is the cause of twenty-five thousand deaths annually in France. Hazen estimates that deaths in this country are at least twenty-six thousand. We know that syphilis is seldom put down as a cause of death. But when one considers that a great many cases of apoplexy, aortitis, aortic aneurysm, angina pectoris, nephritis and numerous other conditions are caused by syphilis, one can understand that syphilis exacts a heavy toll. Vedder states that syphilis is the greatest cause of death of men in the large cities. From an insurance standpoint the luetic has been a bad risk, the conservative reports showing that those who had a luetic history gave a mortality of thirty-three and one-third per cent above expectations.

Another interesting point in connection with prognosis is the question of different strains of treponema. Nichols and Reasoner have done a great deal of work on this problem. They have demonstrated that some strains of treponema may have a selective affinity for the nervous system; others for the cardio-vascular system, another for the skin, etc. Noguchi demonstrated three types of treponema—the thick, the thin and the medium form. The bearing of these facts upon prognosis as put by Hazen is this: “It is highly probable that the future course of syphilis depends almost entirely upon the nature of the infecting organism, and that at some future date it will be incumbent upon the syphilologist to determine just what the nature of the strain is, so that the patient can be more carefully watched.”

From the standpoint of the clinician the prognosis of syphilis is better today than at any time. This was made possible, as stated before, because of the series of discoveries mentioned in the first part of this paper.

The fact that the disease can be treated before the treponema has become widely disseminated should certainly improve the prognosis.

The intelligent use of the Wassermann both as an aid in diagnosis of primary, secondary, tertiary and especially latent lesions and further as an index as to the efficacy of treatment has also wonderfully improved the prognosis of the disease.

Lastly the organic arsenic compounds have likewise changed the prognosis of syphilis. The best proof of this statement is the ever-increasing authentic cases of reinfection since the use of salvarsan in 1910.

What about the prognosis of the various stages of the disease? Most of the cases treated intensively during the treponema positive—Wassermann negative stage should recover. If the patient is still in the primary stage but Wassermann positive the prognosis is good but the treatment must be intensive and over a longer period.

Sargent says that many cases of secondary and tertiary syphilis when treated intensively with arsenic and mercury can be rendered Wassermann-negative and apparently cured.

Late syphilis is probably never radically cured. Under treatment we may keep the Wassermann negative (though not always) and control symptoms.

The subject of the treatment of syphilis is one which is difficult to discuss, for there is no such thing as a treatment for syphilis. While it is true of all diseases that we have to treat a certain disease existing in a certain individual, we believe this to be especially

true of syphilis. Therefore, while we may lay down certain broad lines of treatment, it must be remembered that we have to consider the general condition of the patient, his tolerance of drugs, the stage of the disease, and other factors.

A study of the method of treatment adopted by different men will show that while all agree that both arsenic and mercury should be used in treatment, there is divergence of opinion as to number of doses of salvarsan or neosalvarsan and as to the amount of mercury which should be administered.

In primary syphilis before the Wassermann has become positive Fordyce recommends two courses of treatment, each consisting of five or six injections of salvarsan at weekly intervals with either twenty or thirty injections of a soluble mercurial preparation given daily or every other day or twelve injections of an insoluble salt at weekly intervals.

In secondary syphilis he recommends at least three such courses of treatment.

In tertiary syphilis he recommends courses of salvarsan with mercury followed by the prolonged use of K I and Hg. in the form of mixed treatment.

Fordyce states that in latent lues more benefit is derived from the old-fashioned mixed treatment than from salvarsan alone or combined with K I. "In cardio-vascular syphilis the prolonged use of Hg. and K I is of more value than the haphazard use of occasional doses of salvarsan."

Hazen gives four doses of salvarsan at three to five day intervals followed by four doses at seven day intervals. This is followed by a course of mercurial injections. Then four more doses of salvarsan and then another course of Hg.

In late syphilis he advises that the patient take enough treatment to keep the Wassermann negative and to be symptomless.

The plan laid down in the "Manual of Treatment of Venereal Disease" for the use of salvarsan at five-day intervals followed by five doses at weekly intervals, followed by a course of Hg. Then a rest period of six or eight weeks and the course to be repeated. In cases where the Wassermann has become positive at least three such courses.

In our work we have followed along the lines mentioned above giving courses of five or six arsenobenzols or neosalvarsans followed by courses of mercury. In using mercury we employ either the insoluble mercury salicylate at five to seven day intervals or the mercury succinimide in one-third grain doses twice weekly. We have found it difficult to get patients to come to the office every day or every other day for injections so that

we give large doses of the soluble preparation at longer intervals. Recently we have been using more of the soluble preparations of mercury to the greater satisfaction of our patients. We find that the soluble preparations are not only more comfortable but believe that they are safer, the insoluble salts tending more to irritation of the kidneys. Inunctions of mercury are valuable but are often distasteful to the patient and one cannot always rely on the efficiency of their use.

Of the arsenic compounds we use both the arsphenamine and the neo-arsphenamine and have found little difference in their efficacy. There is more liability to reaction from the former than from the latter compounds.

It is assumed, of course, that the treatment is controlled by the Wassermann reaction, for not only is the Wassermann a diagnostic aid but it serves a second great purpose as a control on the efficacy of treatment. The minimum requirements for a cure must be absence all clinical signs for at least a year. Repeated negative Wassermanns during this period, a negative provocative Wassermann, possibly a negative luetin test, and certainly a negative spinal fluid examination.

DISCUSSION:

Claude G. Hoffman, Louisville: Dr. Bronner referred to a part of the treatment of syphilis. We all know from observations made in the treatment of early and late cases of syphilis, that the fact is emphasized that early treatment of syphilis is the thing. In my opinion no venereal sore, no matter how simple, should be prescribed for in any manner until a competent microscopist has examined the lesion and determined its nature. But unfortunately the majority of patients come to us too late, after they have been to some druggist who has prescribed for them calomel ointment or powder. Even in these cases, if the diagnosis is made from the chancre, the hardest thing in the world is to impress upon some of these patients that they have a chancre or the initial lesion of syphilis. The old idea of waiting until the secondaries appear is still apparent. If a Wassermann is made and the report is negative, they will not start treatment until secondaries appear and that is their misfortune.

In the treatment of syphilis I wish to mention a method which was started in 1916 by Politzer, that is, of giving arsphenamin in doses which would be compatible with the safety of the patient on three consecutive days, following this by 18 injections of salicylate of mercury given weekly or twice a week, three such courses being given during the first year. This method later was tried by Dr. Oliver S. Ormsby, of Chicago, who changed the treatment in this way:

He gave arsphenamin, starting with smaller doses than were prescribed by Politzer, giving two decigrams every second day, and gradually increasing the dose. Several courses were given in a year with two months interval between each course. Following the arsphenamin mercury by inunction or injection was employed. At the end of the first course a Wassermann was made to determine whether it was positive or negative, and if found positive two courses of treatment were afterward given.

I had the pleasure of hearing Dr. Ormsby read his paper entitled "A Valuable Method of Employing Arsphenamin in Syphilis," at the meeting of the American Medical Association in New Orleans. He was of the opinion that, in his cases, better results were obtained by this method than by giving arsphenamin at longer intervals. This method was based on the theory of fractional sterilization. The old method of giving maximum doses at weekly intervals followed by salicylate of mercury has given most men as good results as by the newer method.

As to the practical use of neoarsphenamin and arsphenamin: Some syphilologists have come to the conclusion that neoarsphenamin is absolutely worthless as compared with arsphenamin.

I wish Dr. Bronner would speak of this in closing the discussion. I would like to ask him whether he thinks neoarsphenamin is as good an application as arsphenamin.

Stuart Graves, Louisville: I would like to emphasize one point Dr. Hoffman mentioned in the discussion, and that is the lack of value of a negative Wassermann. In the laboratory of the City Hospital at Louisville, after an experience with some 20,000 Wassermans, I think the weak point about the interpretations is the tendency on the part of physicians, in spite of everything that is said and written as to the significance of a negative Wassermann, still to regard a negative Wassermann as a negation of syphilis. That can be summed up in this way: A positive Wassermann means everything, and a negative Wassermann means practically nothing.

What Dr. Bronner said about a Wassermann in the early stages of syphilis I can verify by personal experience. I have seen a positive Wassermann before the appearance of the initial lesion. I am sure we may have positive Wassermans all the way up to the development of the secondaries. In the secondary stage of syphilis the Wassermann is practically always positive, but there are a very few exceptions. For example, I had a case a few days ago of a man who had had two or three repeated negative Wassermans, but who developed a typical secondary rash which cleared up beautifully under antisyphilitic treatment. The therapeutic test proved the diagnosis. It is only the second secondary stage of syphilis with a negative Was-

sermann which I have had an opportunity to observe personally.

If we take all stages of syphilis—primary, secondary, and tertiary—the Wassermann is probably not positive in more than 50-60 per cent of the cases.

Physicians should educate the laity, who are becoming familiar with the test, that a negative Wassermann does not mean absence of syphilis. Dr. Bronner's paper is an exceptionally good one. It gives us the last word in the diagnosis of syphilis.

With reference to the prognosis: I think we sometimes forget that syphilis is a systematic disease, like all other diseases, and that some people can be cured of it, and some cannot.

So far as the clinical cure of syphilis is concerned, syphilis can be clinically cured; that is, the patient can be freed from signs and symptoms. So far as finding pathological deposits in 40 per cent of all autopsies is concerned, it is open to question. I have read Dr. Warthin's reports and heard his remarks on the diagnosis of syphilis, and he is a man for whom I have the highest respect. However, if one says that 40 per cent of all cases which come to autopsy are syphilitic, I believe he is obligated to prove the statement by demonstrating spirochetes in 100 per cent of such cases. That has not been done.

P. C. Layne, Ashland: I am not a syphilographer, but this paper is one that deserves a good deal of discussion on account of the interest of the subject. You and I know that when we sat on the benches in medical college we were taught by our professors on syphilology to wait for the appearance of the secondary symptoms of syphilis before beginning treatment. Now shall we wait for the first Wassermann before beginning treatment? Is the Wassermann reliable, and shall we always wait for it? Now that we better understand the bacteriology of the disease, I believe treatment should be instituted just as soon as the diagnosis can be made, which can be done in the majority of cases by means of the microscope using either the dark field illuminator or a stained smear, preferably the former.

In the matter of treatment how shall we be guided? Since the introduction of the arsenicals into practice there are many who pin their faith to these; but there are many others high in authority who are not so inclined, and who still believe that mercury is the sheet-anchor in the treatment of syphilis. It is my belief that a wise combination of the two is the proper course to pursue; neoarsphenamin for six or seven doses in the beginning, followed by mercurial injections for a considerable period of time.

There is so much confusion in the literature concerning the choice of a mercurial and its

method of administration that I am like a ship at sea without a rudder: one tells us that the salicylate will not produce a negative Wassermann, another says it will; one says the grey oil injections are worthless because they lie in the tissues for days without being absorbed, yet one of the best syphilographers classes it next in value to arsphenamin. How is the average practitioner going to reconcile these diametrically opposed facts? The answer is, he can not; therefore, some rational method should be placed at his disposal by which he can feel reasonably certain that he is giving his patient a safe and reliable treatment for syphilis.

Another puzzle to me is why in some cases we get a strong positive Wassermann reaction and yet treatment by arsphenamin, mercury, etc., produces no curative results. I have recently had two cases in which this condition was most manifest. Mr. S., aet., 24, was taken ill in July with headache and vomiting coming on at intervals at first, but later becoming continuous; had no cough or dyspnoea; slight intermittent fever. Physical examination negative but for the left side of chest; here there was a line of flatness extending up to the left clavicle; the heart was displaced to the right nipple line; he was now complaining of severe pain in the left side. The chest was aspirated and four pints of dark blood removed, a considerable quantity being left in the pleural cavity. This blood was sent to the State laboratory and a report of three plus Wassermann received in reply.

The patient was immediately given neoarsphenamin along with mercury and the iodides. On July 20 the chest was again aspirated and five pints of bloody fluid removed; July 21 five pints were again aspirated; pleural cavity appeared empty, and remained so until the 24 when it was again filled. The fluid was allowed to remain this time, as it was thought that it might exert sufficient pressure upon the bleeding surface to prevent further accumulation, which it did until August 20 when three pints of dark brownish fluid were again withdrawn in order to relieve the intense dyspnoea from which the patient was then suffering. Antisyphilitic remedies were pushed to the limit all of this time, but without any beneficial effects. Several microscopic examinations of the sputa failed to show the bacillus of tuberculosis. The patient died a month later from general failure of the vital forces. The question to be answered here is: Did he have syphilis or sarcoma of the lung, or a combination of the two diseases?

The next case is that of a young married woman 20 years of age; history negative. I was called by Dr. Swope to see her on account of a very severe attack of gastric pain and vomiting. The symptoms were so violent that the doctor thought she might have obstruction some-

where along the alimentary tract. From a careful examination we came to the conclusion that there was no obstruction, but that the condition was likely due to influenza which was then quite prevalent. The patient passed from my observation for a time, but about two months later I saw her again, with Dr. E. R. Fitch, in a similar attack and she said she had suffered with several others since I had first seen her. After eliminating everything we could think of, it was suggested that the attacks were very similar to the gastric crises of locomotor ataxia and that a Wassermann should be made. Accordingly a sample was sent to the State laboratory, and the report that came back promptly was a four-plus Wassermann. Dr. Fitch at once placed the patient upon full doses of neoarsphenamin and mercury, but without any appreciable benefit. He later reported to me that he had gotten some slight improvement from the use of proteogens. The question again is: Was this a case of syphilis of the nervous system or of the stomach and were we justified in taking the Wassermann as a guide to the therapeutic measures employed? If the Wassermann is to be the guide in the diagnosis, treatment, and prognosis of syphilis the question may be asked why we did not get the expected results in this case.

Leon L. Solomon, Louisville: There is one phase of the subject, under discussion, which particularly interests me, and that is the variable Wassermann findings in different serological laboratories, and the state of mind of the patient or the family, based on the Wassermann report. If the patient has been told of a "positive," he often goes to some other laboratory, and, provided a "negative" is obtained, he accepts the latter, rather than the former. Similarly, we recall how the tuberculous patient seeks the physician, whose examination of sputum fails to disclose the acid fast bacillus.

Recently, I was in court, when the Wassermann subject was up for discussion. I maintained, as did Professor Graves, just now, that a positive Wassermann is a positive finding, which should stand as such, while negative Wassermann proves nothing. Frequently, you are in a predicament with your patient, when some other laboratory hands in a report of a negative Wassermann, while yours has just been returned, positive. Possibly, treatment has already been administered—maybe none. After a persistent course of treatment, which includes a number of salvarsans or neosalvarsans, a change in Wassermann is naturally expected. But there are cases, in which no treatment has been instituted, the patient simply being dissatisfied with the diagnosis, has gone elsewhere and gotten a negative Wassermann. In these cases, there is difficulty in satisfying the patient. I was happy to hear Professor Graves say, that a large per-

ent of Wassermanns are not dependable. In comparing laboratory findings with clinical observation, I have been led to believe, that fully 80 per cent of Wassermanns are dependable. The report of a **positive** Wassermann by a competent laboratory technician should stand as against a **negative** report, it matters not where made.

I believe the profession should take a firm stand on this important point. A positive Wassermann, corroborating clinical manifestations, and there can be no question about the diagnosis. In a malpractice suit, that now threatens, the position is taken, that a positive Wassermann though in a clinically positive case, which was later found negative, by another technician, did not justify a certain physician in administering salvarsan. Positive Wassermanns are positive findings. Negative Wassermanns do not necessarily mean absence of syphilis, as we all know.

Claude G. Hoffman, Louisville: Dr. Graves, in mentioning the case he reported some time ago, did not say he was unable to demonstrate spirochaetes in the lesions. The lesions had been cauterized. After the secondaries appeared two Wassermanns were made and both were negative. The patient had the secondary symptoms of syphilis; he had mucous patches and rash from head to foot. I suggested a dose of arsphenamin as a therapeutic test, and in three days the whole thing disappeared like magic. Dr. Graves looked for the spirochaetes, but as the lesions had been cauterized he was unable to demonstrate them.

Herbert Bronner, closing the discussion: I was not able to finish my paper. I am sorry I was not because I wanted to make my own comments on Warthin's findings and give the benefit to the clinician. In the first place, I believe that with all the aids you and I have today, with the ability we have to make an early diagnosis, with the ability to follow our cases, both from a diagnostic and prognostic standpoint by means of well-made Wassermanns, and with the advantage of both mercurials, and arsenical therapy, I doubt very much whether we would get that high percentage of syphilitics that Warthin shows. In other words, I believe that a great many of Warthin's cases were cases that had been treated years ago, before we had the advantages we have today. In other words, I think the prognosis of syphilis today is better than it has ever been in the history of its existence for the three reasons I have mentioned, first, because we have the advantage of making an early diagnosis; second, we have the advantage of following therapeutics by means of a well-made Wassermann, and third, we have the advantage of not only the use of mercury but of salvarsan.

I have not sufficient time to go into the question of a negative Wassermann, but if any of you gentlemen are interested, I would like you

to read an article by Sargeant, of Milwaukee, in the Archives of Syphilis, in which he tells you of the value of a negative Wassermann.

I did not get a chance to discuss treatment. I want to answer Dr. Hoffman's question. Personally, I believe we get as good results therapeutically from neosalvarsan as from arsphenamin.

Dr. Cowley has just asked me whether luetin is of any value in diagnosis. In my experience its value is very little. There are so many things that may come up that counteract its effect, that I place very little reliance on the luetin reaction.

BACILLUS COLI INFECTION OF PROSTATE AND SEMINAL VESICLES: WITH REPORT OF FIVE CASES*

By **CLAUDE G. HOFFMAN**, Louisville.

For the isolation and accurate description of the bacillus coli communis, we are indebted to the clinical and experimental researches of Emerich published in 1885. He demonstrated that the intestinal tract of man and certain animals was the habitat of this organism under both normal and abnormal conditions, and for that reason it was originally presumed to be intimately related to the bacillus of Eberth which it closely resembles morphologically. However, later investigations have shown many essential differences between the two organisms.

For some time it was doubted whether the bacillus coli alone was capable of inciting morbid phenomena in the human economy or elsewhere than within the intestinal tract, although the organism was oftentimes found associated with other bacteria in various types of infection. Not until quite recently was the fact established that the colon bacillus may invade and incite morbid processes in any organ or tissue of the body. In certain instances it is the sole or predominating organism; in others it is associated with unrelated bacteria; it is present in many cases of so-called mixed infection regardless of the original causative factor or the site of the pathology.

The capability of the colon bacillus alone to produce infective lesions in any portion of the urinary tract is now an accepted fact. While the route by which the organism gains entrance into the urinary apparatus does not appear to have been definitely determined, it is presumed infection may be either: (a) lymphogenous, (b) hematogenous, or (c) by contiguity of structure. It is reasonable to

*Read before the Kentucky State Medical Association, Lexington, September 27, 28, 29, 30, 1920.

assume the latter mode of invasion is more frequent than generally believed, since it is known the bacillus coli possesses a certain degree of motile power.

It is agreed by the majority of observers that the portal of entry of the bacillus coli into the urinary tract may be doubtful where no previous instrumentation has been practiced. It has been demonstrated (Frank) by injecting the lymphatic vessels of the large intestine that the lymphatics of the ascending colon communicate with those of the right kidney and lumbar nodes, while those of the descending colon pass over the capsule of the left kidney; further that the colon bacillus finds its way into the mesenteric lymph nodes of artificially constipated animals, and that the organisms may pass from the lymph glands into the circulation. The kidney is more frequently invaded by the colon bacillus than other portions of the urogenital apparatus, but as the title of this paper excludes renal infection, that phase of the subject cannot be discussed.

In bacillus coli infection of the prostate the seminal vesicles and epididymi may or may not be involved. Of five cases of colon bacillus prostatitis coming under my observation the seminal vesicles were affected in four; in one there was an accompanying bilateral epididymitis. In all the cases the infection was acute in type and the bacillus coli was the predominating organism as shown by bacteriologic and cultural methods of investigation. In only one case was there a history of antecedent venereal disease. Involvement of the prostate and seminal vesicles from mixed infection following improperly treated Neisserian urethritis is quite common, but such cases cannot be further discussed in this paper. Acute prostatitis, epididymitis and seminal vesiculitis due to bacillus coli invasion must be rather rare, as few such cases have been recorded in available literature. Chronic cases are common, but these are usually due to mixed infection.

The symptoms of acute prostatitis, regardless of the causative factor, are well understood and need not be described in detail. The patient usually has an initial chill followed by elevation of temperature; he complains of acute pain in the perineum which develops rather suddenly; sometimes radiating toward thigh, lumbar region, penis or testicle; discomfort is aggravated during micturition or defecation; rectal and vesical tenesmus, dysuria and pollakiuria are annoying manifestations; the urine is cloudy, and microscopic examination reveals pus and prostatic shreds. In some instances, however, the patient complains only of vesical symptoms. In

such cases the physician is likely to make an erroneous diagnosis of proctitis, and treatment is in consequence mis-directed; the prostate is not examined because the symptoms indicate only vesical involvement. That was true in one of my cases.

Physical investigation discloses a "boggy" or "doughy" enlarged and tender prostate, i.e., the ordinary clinical evidences of localized acute inflammation. In most instances abscess formation can be prevented by appropriate early treatment. The diagnosis, therefore, is fraught with no difficulty provided one is familiar with the symptomatology and understands modern methods of examining the prostate. In all acute cases bacteriologic and cultural methods of examination will demonstrate in the urine and prostatic excretion the organism responsible for the infection. The seminal vesicles should always be carefully palpated when the prostate is examined to determine whether or not they are also involved in the infection. When it is remembered that the normal seminal vesicle can rarely be detected by the palpating finger, the diagnosis of vesicle involvement is not difficult.

CASE REPORTS:

Case 1. Male, aged 42, with negative venereal history, consulted me April 21, 1919, because of acute perineal pain accompanied by dysuria. He gave the history of a similar attack six years before, at least the symptoms he described were identical. He complained of severe vesical and rectal tenesmus, dysuria and pollakiuria; micturition was necessary six or eight times each night and oftener during the day. His temperature was 102.2 degrees F., and a slight chill had occurred the day before I saw him. Physical investigation revealed a large, soft and sensitive prostate; both seminal vesicles were palpable. The three-glass test showed urine cloudy; shreds and pus abundant on microscopic examination. I advised rest in bed, frequent sitz baths, hot rectal douches twice daily and urinary antiseptics internally.

After subsidence of acute symptoms the urine and prostatic excretion were cultured and the bacillus coli found predominating in both. Autogenous vaccine was then prepared and administered at stated intervals. On May 30 the prostate was still sensitive, the three urines were cloudy, and microscopic pus was present. The vaccine treatment was continued, and on July 2 all clinical symptoms had disappeared, the prostate was negative, the urine contained no shreds nor pus, and the patient was discharged as cured.

Case 2. Male, aged 58, with negative venereal history, came to me May 6, 1919, com-

plaining of pollakiuria and severe vesical tenesmus. There had been no chills, but his temperature was 102 degrees F. Physical examination revealed the prostate soft, large, "doughy," and very sensitive, giving evidence of parenchymatous inflammation. Three-glass urine cloudy and microscopically "loaded" with shreds and pus. May 8 the patient had a severe chill and developed acute bilateral epididymitis; temperature 104 degrees F.; all pre-existing symptoms intensified. Prescribed rest, sitz baths, hot rectal douches twice daily, laxative and urinary antiseptics. On May 10 he had another chill and prostatic abscess was feared, but fortunately did not develop. The blood count at that time showed:

Erythrocytes	not counted
Leucocytes	9,000
Differential count:	
Polymorphonuclears	89%
Lymphocytes	7.5%
Endothelial leucocytes	3%
Eosinophiles	5%

Culture of the urine and prostatic excretion showed the bacillus coli as the predominating organism.

The acute symptoms subsided after six days and autogenous vaccine was then prepared and given in the routine way as in case one. Under this method of treatment the patient made a satisfactory recovery and was dismissed cured on June 30.

Case 3. Male, aged 31, from another city, consulted a Louisville physician, complaining of vesical symptoms, and was referred to me September 5, 1919. No venereal history could be obtained. Examination demonstrated that he had acute prostatitis. Culture of the urine and prostatic excretion showed bacillus coli as the predominating organism.

After the acute symptoms had subsided under rest, hot rectal douches, sitz baths and urinary antiseptics, autogenous vaccine was prepared and administered by his physician according to directions after the patient went home. He returned to Louisville four months later at which time the prostatic excretion, urine and prostate were negative, but the left seminal vesicle was palpable. Autogenous vaccine treatment was again used with satisfactory results. The patient was dismissed three weeks later with physical findings, prostate and prostatic excretion negative, although the urine still showed microscopic pus.

Case 4. Male, aged 45, gave a history of Neisserian infection twenty-two years ago, and had been a confirmed neurasthenic for the last ten years. He consulted me April 21, 1920, because of frequent nocturnal seminal emis-

sions, loss of twenty-three pounds in weight, and general weakness. Examination revealed both prostatic lobes slightly enlarged and sensitive; right seminal vesicle palpable.

I did not see the patient again until May 2, when he returned saying that he had a severe chill the previous night following which his temperature rose to 105 degrees F. Nocturnal pollakiuria had also become an annoying symptom; micturition necessary six or seven times each night. All three urines "loaded" with pus. Excretion expressed from right seminal vesicle was blood tinged. Cultures from urine as well as excretion from prostate and vesicle showed pure colon bacilli. The patient was placed in bed and the usual treatment applied. Afternoon temperature 104 degrees F., for the next three days. The first injection of autogenous vaccine (200,000 bacilli) was followed by a severe reaction, i.e., typical anaphylactic shock. Five days later the patient had another chill followed by extensive herpes soster. He was kept in the hospital for nearly six weeks.

Note: August 7, 1920: The patient has gained twenty pounds in weight and is able to attend to his work. The right seminal vesicle remains palpable but no excretion can be expressed by stripping. Patient still under treatment.

Case 5. Male, aged 31, without antecedent venereal history, consulted me May 22, 1920, complaining of dysuria, pollakiuria and pain in right lower abdominal quadrant radiating toward the hip. Micturition necessary four times at night and six or eight times during the day. There had been no chills; temperature 102.4 degrees F. Examination showed the prostate slightly enlarged but not very sensitive. The right seminal vesicle was palpable and sausage-shaped, giving evidence of acute vesiculitis. The testicles were normal; left epididymis somewhat thickened. All three urines clear but contained an abundance of shreds. Seminal vesicles stripped and prostate massaged in the usual manner; culture from the material showed bacillus coli predominating. The patient was placed in bed under the usual treatment including autogenous vaccine. The seminal vesicles were stripped every three days. The temperature became normal at the end of twelve days.

Note: August 7, 1920: Right seminal vesicle still tender and palpable. Patient still under treatment but is able to attend to business.

COMMENTS:

As already intimated, the subject of urogenital infection in patients without antecedent venereal history has received scant attention in the literature. In four of the cases

cited herein there was no history of previous venereal disease, and culture demonstrated that the bacillus was the predominating etiologic factor.

In a paper on hematogenous bacillus coli infection of the male urogenital tract Rovsing describes the clinical picture, diagnosis and treatment of the infection involving the epididymi, seminal vesicles and prostate, and cites several case histories representing each type. In each of five cases of coli abscess of the prostate the diagnosis of urocystitis had been made. In one of these the abscess had to be evacuated through the perineum; in the others massage and autogenous vaccine resulted in speedy cure. In eighteen cases of coli infection the trouble began in the seminal vesicles and extended downward to the epididymi. In six the onset suggested acute pyelonephritis; in others the insidious onset and chronic course deceptively resembled urogenital tuberculosis. In each group colon bacilli and pus were found in voided urine while catheter-urine from the bladder was normal. There was no history of antecedent venereal disease in any of the twenty-three cases described but in all there was a history of chronic constipation and intestinal inflammation. The epididymi in these cases were more diffusely swollen and fibrous than is true in tuberculosis. In one typical case a man of 43 with chronic constipation developed diarrhea followed by subacute epididymitis which recurred and passed into a chronic phase. In other cases there was a history of sigmoiditis or recent typhoid. In three, pressure from a truss on the intestine and vas deferens may have been a factor. In about half the cases dysuria and pollakiuria with slight admixture of blood at the beginning or end of micturition led to the assumption of urogenital tuberculosis; in fact, twelve patients with coli epididymitis had been subjected to epididymectomy under the erroneous diagnosis of tuberculous involvement.

Swinburne suggests that non-venereal prostatitis will eventually be recognized as being almost as common as chronic tonsillitis. One reason for non-recognition is that the disease may exist an indefinite period without inducing symptoms suggesting the prostate as the focus of infection; another is that few physicians examine the prostate; and if they make such an examination they conclude when pus is found that the disease must be of venereal origin or due to tuberculosis. The author reports four cases of non-venereal prostatitis in which satisfactory results followed prostatic massage, instillation of ten-per-cent argyrol solution into the vesical cavity, applica-

tion of high frequency current to the prostate, etc. He says such cases may exist without marked symptoms, or with manifestations so slight as to be unnoticed by the patient, until after a suspicious sexual intercourse, "when he examines himself more carefully" and a condition is then noted which may have existed for some time.

In a preliminary report on "Sequelæ of Influenza in the Genito-Urinary Tract" Bronner records four cases, the prostate being affected in two. In one of the latter the patient gave no antecedent history of venereal disease. The author states that the prostate was decidedly enlarged and tender; urinalysis showed colon bacilli. In the other it is stated that "examination per rectum found an enormously enlarged and boggy prostate." Pre-rectal incision liberated a large quantity of pus; culture showed colon bacillus and micrococcus tetragenus.

Bugbee reports thirty-nine cases of urogenital infection in males following influenza. In twenty-two there was unilateral or bilateral kidney involvement; in five perinephritis abscess; in four prostatic abscess; in one perinephritic and prostatic abscess; in six epididymitis, and in one seminal vesiculitis. No mention is made concerning the presence of colon bacilli in the urine or pus from the abscess cavities. The author states that "perinephritic abscess, prostatic abscess, and epididymitis may be a part of any hematogenous infection."

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NOTE: Portions of this paper and three of the case histories appeared in the *Urologic and Cutaneous Review*, St. Louis, Mo., July, 1920, pp. 375-377, C. G. H.

DISCUSSION:

Herbert Bronner, Louisville: As Dr. Hoffman has very aptly said, we used to think the intestinal tract was the only habitat of the colon bacillus. We now know it is ubiquitous. We urologists look for it in the urinary tract. In my own experience I have seen quite a few cases of colon prostatitis, and broadly I would divide them into two classes, first that class in which the original infection was unquestionably Neisserian in character, but in which after a number of months

or years, after the most careful search, the gonococcus can no longer be found, and in which the trouble is kept up by the colon bacillus. The late Dr. Sachs, of New York, was the first man to bring out this point. Very frequently in cases of prostatitis the infection is kept up by other organisms, and while in most cases the symptoms are chronic in character, I have seen an acute flare up corresponding to the cases described by Dr. Hoffman in his paper.

The other class of cases are those in which there is no venereal history at all, and in which the infection is a colon bacillus infection from the beginning. Some cases that I mentioned in a paper all followed a severe epidemic of influenza. These patients while convalescing from influenza developed symptoms in their urinary tract. Their resistance had been lowered, and the colon bacillus was around ready to do damage and to produce infection. In two of these cases, as I recall, of the prostate, one of them responded to the line of treatment suggested by Dr. Hoffman. One came to operation. Since that report I have seen several other cases. In one case, in addition to colon infection of the prostate, there was a perinephritic abscess which had to be opened, which showed the colon bacillus, and in another one a colon pyelitis. In this case the infection was hematogenous in character. This opens up a fascinating field which Dr. Hoffman touched in his paper, that is, the *modus operandi*, the route of infection, in urinary infections. I believe that in most cases we are now agreed that infections of the genito-urinary tract are hematogenous in character, and that in the second class of cases the infection is probably through the lymphatics.

C. G. Hoffman, closing the discussion: I wish to thank Dr. Bronner for his discussion. He divides these cases into two classes. Of the cases I have reported only one patient had an antecedent venereal history. In old prostatitis, of ten or twelve years duration, there will oftentimes be an acute "flare up" caused by the colon bacillus which has engrafted itself on a dormant infection. That happens in most cases. With the one exception noted, the cases I reported were purely acute caused by the colon bacillus without any venereal history whatever.

I have seen during the past year a great many patients with prostatitis who gave venereal histories of ten or fifteen years duration which had become absolutely dormant, and upon examination some pathology of the rectum was found, i.e., there was some acute condition present in the intestinal tract or rectum before the acute prostatitis developed. It is a question whether we can get infection by contiguity of structure.

THE TREATMENT OF GONORRHEA IN THE FEMALE*

By THOMAS C. HOLLOWAY, Lexington

The subject assigned to me is one concerning which there has been very little discussion in the current literature of recent years. This may be due in part to the fact that the principles upon which our present day treatment is based were long ago determined, and there remains very little that is new to be added. I feel very sure, however, that another reason is to be found in the failure on the part of physicians generally to recognize the far-reaching and vital importance of the subject.

As a result of this failure, a very small percentage of women suffering from gonorrheal infection apply to a physician for any treatment whatever in the acute stage of the disease, and of this number, it is unfortunately only too true that in many cases an accurate diagnosis is not made, and the patient is given some palliative treatment such as a routine douche, or a urinary antiseptic, without the physician having suspected the real cause of the condition, or having taken the pains to confirm his suspicion by laboratory examination.

The importance of prompt and energetic and faithful treatment may be appreciated when we reflect that to this cause may be traced a very large percentage of those serious and mutilating operations upon women found necessary in that large group of cases which are classed as "pelvic inflammatory disease," in addition to an untold number of cases of acquired sterility, semi-invalidism of women, and about fifty per cent of the blindness of children in this country.

Amid all the triumphs of modern medicine, in an age that has been marked by the most stupendous advances in so many other fields, we are forced to admit that in the preventive and curative treatment of gonorrhea of the female there has been no notable advance during the past twenty years.

In considering this question it occurred to me to inquire to whom does the treatment of these cases in the acute stage properly belong? Upon submitting this question to a number of my friends, I found that the genito-urinary specialist feels that they should be referred to him, while the gynecologist says that they belong to him. However, I am convinced that by far the greater number of these cases must be recognized by the general practitioner and

*Read before the Kentucky State Medical Association, Lexington, September 27, 28, 29, 30, 1920.

probably in the vast majority of cases, managed by him.

Unfortunately, the symptoms of gonorrheal infection in the female are usually of such a mild character as to cause the patient to seek the advice of her physician only in those rather rare cases where there is great pain on urination or a persistent leucorrheal discharge where it has not existed before, and it is therefore incumbent upon the conscientious physician to be ever vigilant and to exclude this possibility by careful and thorough examination in every case where there is any cause whatever for such a suspicion—thus and thus only may we hope for a larger percentage of these unfortunates to be brought under treatment before the more serious, chronic and oftentimes irremediable complications have occurred.

Gonorrhea in the female may be present in one or more of the following conditions, according to the anatomical structures involved: vulvitis, inflammatory lesions of Bartholin's glands, condylomata acuminata vaginitis, urethritis, cervicitis, corporeal endometritis, and metritis, salpingitis and oophoritis.

In addition we have to consider the complex pathology embraced under the term pelvic inflammatory disease with its various complications such as, ectopic gestation, peritonitis, torsion, and rupture of the uterine adnexa, infection of intrapelvic neoplasms, the complication by gonorrheal infection of pregnancy, labor and the puerperium and the extra genital forms of gonorrhea as seen in cystitis, adenitis, proctitis, stomatitis, rhinitis, ophthalmia in infants, young girls and adults, gonorrheal septicemia, gonorrhea of the osseous and circulatory systems particularly gonorrheal arthritis, gonorrhea of the lungs, pleura, kidneys, nervous system; parotiditis, suppurative myositis, subcutaneous abscess and wound infection.

It would be manifestly impossible within the scope of this paper to give in detail the treatment of these varying conditions.

Even a casual inspection of this list of possibilities gives to every gonorrheal infection a significance worthy of the very best skill and most careful attention of which the physician is capable.

The underlying principles of treatment are the same in each case, consisting of bringing a suitable antiseptic, such as permanganate of potassium, or some one of the silver salts, iodine or phenol, into contact with the invading organism. The specific cause of the disease, the diplococcus of Neisser, so named for its discoverer who reported his observations in 1879, is easily killed by exposure to unfavorable conditions of heat or moisture, or to

comparatively weak solutions of the antiseptics mentioned. The great obstacle in the way of successful treatment is found in the difficulty of bringing all the organisms present into contact with the remedy.

Perhaps in summarizing the treatment of gonorrheal infection in its ordinary form in the acute stage, I could not do better than to quote from a personal communication from Barney, of the Harvard Medical School, his routine treatment as employed in the clinic of the Massachusetts General Hospital: "The vagina should be wiped clean with cotton and its walls and cervix painted with tincture of iodine and the cervical canal swabbed thoroughly with iodine or with ten per cent argyrol. The urethra should be stripped clean of pus and an instillation of ten per cent argyrol should be given. I lay great stress on the importance and frequency of infection of Skene's glands and the orifice of these glands, which incidently may be difficult to find, should be inspected and if they are infected should be injected directly by means of a blunt needle or a hypodermic syringe using again ten per cent argyrol or one per cent silver nitrate. The patient should be instructed to take a douche once, twice, or perhaps three times daily of hot permanganate of potash solution 1-4000. This should be given or taken lying down on the bed on a bed-pan or douche-pan and given slowly so that the solution will remain in contact with the parts as long as possible."

My friend, Dr. Bremerman, of Chicago, describes a method very similar in principle, but differing somewhat in detail as follows: "It is our practice to begin active treatment just as early as possible. This consists in irrigating the vagina thoroughly with non-irritating solution, such as sterile water, normal salt solution, boric acid, et cetera; then a lightly packed tampon saturated in a solution of two per cent nargol is inserted, to be retained for about six or eight hours. This, is to be followed by an irrigation given by the patient herself. A solution of permanganate of potassi 1-6000 to 8000 given as hot as can stand. The following morning she repeats the irrigation and presents herself for another treatment, which is similar to the first. This rapidly clears up the infection, and prevents its progression into the cervical canal and will prevent more serious complications."

The important point which I would emphasize is that the patient should be so thoroughly impressed by the physician with the serious consequences which may follow neglect of this seemingly mild infection as to cause her to continue treatment until dismissed.

Frequent attempts have been made to employ vaccines in the treatment of these conditions, but aside from certain cases of vaginitis in young children and acute gonorrhea these effects have been unsuccessful.

Passing now to a consideration of the later manifestation of the disease which appear as acute or chronic pelvic inflammatory disease, I have endeavored to ascertain, authoritatively, what percentage of these cases may be traced to gonorrheal infection.

In the masterly and exhaustive monograph by Norris on gonorrhea in women, statistics are given by various observers varying very greatly, showing the following percentages of pelvic disease due to gonorrhea: Price, ninety per cent; Norris, eighty per cent; Pozzi and Frederie seventy-five per cent; Clark, fifty per cent; Davis and Noble five-tenths per cent. Bovee, of Washington, in answer to my questionnaire, gives seventy per cent, while Stone, of Washington, says fifty per cent, probably more, and Polak states that in his clinic eighty per cent of the chronic pelvic inflammation can be traced directly or indirectly to gonorrhea. Burnam, of the Howard A. Kelly Hospital, at Baltimore, says at least eighty per cent is due to this cause.

These variations may be explained by taking into account the different classes of practice—whether dispensary or private patients upon which the observations are based. From these reports it would seem fair to conclude that from fifty to seventy-five per cent of these cases, which so frequently require severe and mutilating operations, and in any case result in the vast majority of instances in absolute sterility are due to gonorrhea.

The treatment of this condition in the acute stage must be confined to rest and such palliative measures as the application of heat or cold to the lower abdomen, the careful use of mild laxatives and frequent copious vaginal irrigations.

All operative interference at this time is likely to do harm except in those rare cases where delay would clearly endanger the life of the patient, or where accumulations of pus may be evacuated without traversing the peritoneal cavity. Fortunately the inflammation resulting from gonorrhea infection of the Fallopian tubes, and ovaries, unlike that resulting from other pyogenic micro-organisms, tends to become chronic. The adoption of the waiting policy in dealing with these cases makes the greatest advance which has been made in recent years in their treatment. While it is true that in the great majority of such cases operation will ultimately become necessary, the mortality is greatly reduced, and the most satisfactory results are obtained by treat-

ing these expectantly throughout the acute stage.

Norris, after a very complete review of the reports from authorities in this and other countries, thus concludes: "The author believes that, in spite of any form of palliative treatment that may be adopted, the majority of gonococcal inflammations of the appendages will ultimately require operative intervention; nevertheless, he is of the opinion that a fair trial of such treatment should be made in each case, and by that this method better operative results will be obtained than if immediate operation were undertaken. Under the palliative treatment the infective micro-organisms in many cases become innocuous, and the uterus and adnexa again approach the normal. Nature has been allowed to cure as much of the pathology as possible, and when the abdomen is opened, one can more easily decide upon the most suitable operation for the individual case. There can be no doubt that following the expectant treatment a greater number of cases will be rendered suitable for conservative operations than if they were at once subjected to surgical treatment during the acute stage. Furthermore, the mortality will be reduced. Following this plan Simpson has reported 475 consecutive abdominal sections for inflammatory lesions of tubal origin, with only four deaths. In addition to the reduced mortality, the postoperative results will be improved. It will be found that the operation can be performed with greater speed and less anesthetic will be required, and fewer hernias and a lessened proportion of operative infections and consequent postoperative adhesions will be encountered.

By converting acute inflammatory infections of pelvic origin into aseptic lesions the mortality will be reduced and the postoperative results vastly improved. Undoubtedly, occasionally cases will be encountered that will not improve under expectant treatment, but the more carefully these cases are studied, the fewer will be the number requiring immediate operative intervention. Sanger, the skilled pathologist and gynecologist par excellence, was the first to lay stress on the fact that chronically adherent appendages were not the seat of infection, but merely the derelicts of the gonococcal storm. Accuracy of diagnosis is the necessary adjunct to this treatment, and only by its aid can the surgeon successfully adopt the waiting policy. Bumm is of the opinion that the majority of cases of postoperative peritonitis result from too early operation. He thinks it best to wait until the infection becomes localized, as sometimes there is a mixed infection, and early operation on such cases frequently results in fatal perito-

nit. Thaler, after having reviewed 6,179 cases of pelvic inflammatory disease at Schauta's clinic, concludes that operative treatment is indicated only after palliative treatment has failed, except in cases where it is necessary to evacuate pus.

Having thus briefly and imperfectly stated our present position with reference to a great problem, which stands as a reproach not alone to our profession, but to our civilization, the question properly arises, "what may be accomplished along the lines of prophylactic treatment."

I realize that this raises an old, old question, the discussion of which is uninviting, but for their failure to find an answer, empires, kingdoms, and civilizations in ages gone have paid the price of their existence. Do not the triumphs of modern medicine over yellow fever, and typhoid fever and cholera and small pox, inspire us with courage, in undertaking the fight against this great black plague that stands today by far, the greatest enemy of the race—it has been shown conclusively that education alone is not sufficient although of vast importance; that laws alone are not sufficient; that the efforts of medical men alone are inadequate. It is a many-sided problem which must be approached from all sides at once.

In this connection, I desire to commend most earnestly to the careful consideration of every member of this association the so-called American Plan, as suggested and advised by the American Social Hygiene Association, which has already been productive of noteworthy results.

This plan may be briefly stated as follows: "Few diseases are more completely understood by science than are the venereal diseases. All the knowledge necessary to eliminate them is available. Yet they are notoriously uncontrolled—so much that Sir William Osler could call syphilis the greatest killing disease, while gonorrhea is generally calculated to be from three to five times as prevalent as syphilis."

The failure of civilized nations to get the better of these diseases is of course due to the fact that they are inextricably interwoven with some of the strongest prejudices, institutions, and emotions of the human race. History has conclusively shown that they are immune to an attack made from only one side.

Recent history has no less conclusively shown, as medical theory had previously outlined, that they could be conquered by an attack from all sides at once. The fourfold plan of campaign, commonly known as the American Plan, regards the venereal diseases

as being spread mainly through commercialized prostitution, and as predominantly a problem of preventive medicine. It proposes to set up four barriers to their spread:

(1.) Wholesome recreation, to take the place of unwholesome sex experiences.

(2.) Education, to give men and women an understanding of the place of sex in life—the great value of its proper use and the untoward consequences of its misuse.

(3.) Repressive and protective measures to prevent the exploitation of sex attraction as a means of gain, and thereby reduce the number of exposures to infection.

(4.) Medical measures to render non-infectious those who have once been infected, in order that they may not communicate the diseases to others. The cure of those infected is of course important, too, but must not be allowed to obscure the fact that prevention is the best safeguard for the individual as well as for the community.

In the carrying out of such a plan there are many factors of the problem that are most encouraging. The extension of the public health service by the national government, the recent passage of a model law for the control of venereal disease in our own state, the awakening of the public interest in the subject, by the lessons and experiences of the war, the abolition of these great strongholds of commercialized vice, the red light district, and its strongest ally, the corner saloon, the extension of the franchise to women, all speak for a brighter day, and lend encouragement to the hope for victory in this stupendous undertaking.

When this whole question is removed from the hands of the fanatical moral reformer, and placed as it should be within the realm of common sense, intelligent, practical business efficiency, and simple justice, will demand that this widespread evil be controlled, and the innocent victims protected.

Ignorance, indifference, false modesty, and prudery have too long stood in the way of any advance along these lines. Whenever the whole people are awakened to a real desire to abate the evil, and are willing to lend themselves whole-heartedly to the task—then and not till then will it be accomplished.

Summarizing what has been said the following conclusions may be stated:

(1.) Every case presenting any symptoms of gonorrheal infection demands on the part of the attending physician thorough clinical examination, including such laboratory tests as may be necessary to make accurate diagnosis.

(2.) When the diagnosis is made the true nature and significance of the disease should

be frankly stated to the patient, the provisions of the law explained, and such measures instituted as may serve to protect the patient and his associates from the consequences which are otherwise inevitable.

(3.) The treatment in the acute stage of gonorrhea in women requires daily attention on the part of the physician, with thorough application of antiseptics to affected parts, supplemented by copious and frequent vaginal irrigations with permanganate of potassium solution.

(4.) When pelvic inflammation occurs only palliative measures are indicated until the acute symptoms shall have subsided, when operative interference is usually necessary.

(5.) Every physician, both in his own practice and to the full extent of his influence, should lend his hearty and active support to the various agencies, whether local, state or national, seeking to combat this great national menace.

(6.) The attitude assumed by many physicians that treatment of this class of cases is beneath their dignity is unworthy of present-day ideals and standards for the practice of medicine.

(7.) The prophylactic measures used with such marked success in the army and navy during the war, should theoretically have a large place in combating this plague in the civil population, but administratively, their employment is attended with so many difficulties and dangers as to very greatly limit their usefulness.

DISCUSSION:

Scott D. Breckinridge, Lexington: I am glad the urologist shows the gynecologist that he has primary claim to this class of diseases. I was interested in Dr. Holloway's paper but I would like to take the liberty of hammering a little more on the practical end of the diagnosis and treatment of the disease as the case comes to the physician's office. In the first place, a very large proportion of the cases of gonorrhea in the female, as Dr. Holloway pointed out, are chronic. I think this means very often in our original examination, which includes the making of smears, we do not get the gonococcus. This leads us to ignore the fact that the gonococcus may nevertheless be present. I think in all these cases some provocative treatment should be followed to bring out the gonococcus, in patients. This will sometimes be found by taking smears shortly after menstruation. If they do not show following the menstrual period, chemical irritation of the vaginal canal or the portio vaginalis will cause sufficient irritation to bring out the gonococcus. No woman with an irritating vaginal discharge of long standing, where there is

any reason for suspecting gonorrhea, should be given a negative report unless these things have been tried.

In regard to the treatment of these conditions, I think what we want is a method of treatment that every general practitioner as well as specialist can employ in his office, and I think that so far as the cervical and vaginal infection is concerned, its treatment is easily attained.

The treatment of vaginal infections, which, by the way, are very rare except in the early stages, is most satisfactory. One author uses a saturated solution of picric acid in glycerin. It is best applied with the Sims' speculum with the patient in the knee-chest or Sims' position, where the vagina is ballooned out by posture and the Sims' speculum. The vagina is cleansed with Dobell's solution or any other alkaline solution to remove the mucus; the solution of picric acid is poured in and the vagina tightly packed with gauze. With about three such treatments, or maybe four, the whole vaginal mucous membrane will ordinarily come away almost in a cast, and the vaginal infection will promptly clear up.

So far as cervical infection is concerned, I have been using tincture of iodine when patients would stand it, or strong solutions of argyrol, or potassium permanganate. I have recently tried 2 per cent mercurochrome, packing the cervical canal with narrow strips of gauze and putting it around the cervix in the vault, and believe that mercurochrome 220 has given better results than anything I have used before. However, I have not had experience enough with it to speak positively as yet.

Herbert Bronner, Louisville: Dr. Holloway's timely paper has covered the subject so well that there is very little to add. However, I want to make two points. In the first place, it has been my observation that most women with gonorrhea consult general practitioners, and for that reason I think it is very essential that the general practitioner should learn an adequate standardized method of treatment, such as Dr. Holloway has outlined in his paper.

The only other point I want to make is this: The general practitioner should also learn a standardized method of examination before his patient is dismissed; some such method, for instance, as was employed during the war by the United States Public Health Service, and inasmuch as we have a splendid laboratory, which is always at the disposal of any practitioner in the state, there is no reason for any patient, who comes under observation of a physician, being dismissed without these examinations being made.

Leon L. Solomon, Louisville: I was in Washington once and had the pleasure of meeting the late Theodore Roosevelt. I heard him tell a story about himself, which may be applicable to me today. He said he had gone into a town to make

a speech, which he was to deliver the next morning; he arrived late at night; the weather was hot; he was tired and yet desired to cool off, before retiring, so he strolled down the street, only to be greeted by a picture poster of himself, in the show window of a drug store. The poster was prominently displayed with the words "Open day and night," very plainly visible directly across his mouth. I have had the privilege of the floor, so often, during these sessions, I wonder if some of the members will not say, "Solomon's mouth is open day and night." (Laughter.) I could hardly refrain from taking the floor, on this occasion, even though Dr. Arthur McCormack had not requested me to do. It was one of the greatest pleasures of my life, when Dr. J. N. McCormack asked me to serve the State Board of Health of Kentucky as Director of the Bureau of Venereal Diseases, under the supervision of the United States Public Health Service. I wore then, as now, with as much satisfaction, the emblem of the U. S. P. H. S.

The question brought to our attention by Dr. Holloway has never before been emphasized by a member of this society, since the establishment of the Bureau of Venereal Diseases. It is a blight—a sad blight and a disgrace, that the medical profession has not, in times gone by, taken a positive stand to eradicate the three venereal diseases. It required the strong arm of the Government, in times of war, (when we had to send men across "fit to fight") to discover that we must wage a fight against the sex diseases. We waged the fight as a war measure, discovering then its benefit. Before the war had come to an end, the United States Public Health Service took upon itself the furtherance of the fight, establishing a campaign, so splendidly presented by Dr. Holloway in his paper. I want to say this much, and I believe we have then said all, regarding the treatment of gonorrhea in the female: Gonorrhea in woman is due to gonorrhea in man. When we, as doctors, make plain to fathers and mothers what the venereal diseases mean, we will have accomplished much. I address myself now to one, only, of the three venereal diseases, gonorrhea, because it, only is up for discussion. As physicians, we should not look upon gonorrhea, as a slight ailment, but as a serious malady, emphasizing to parents the importance of educating their sons and daughters, regarding the dangers of infection. Then, we will succeed, and not otherwise, in the treatment of gonorrhea in the female. As long as man remains man, with the sex instinct so positively a part of his creation, and this must ever be so; as long as the command, "Increase and multiply and become as numerous as the sands of the seashore," only knowledge, which breeds fear of sex diseases, will limit their incidence. Education, which makes plain to the father the

danger of infection will be transmitted by father to son. Women get gonorrhea from men, and having gonorrhea, they infect men and will continue to infect men, unless men are taught to have an abiding fear of the loose woman. The Government has undertaken to eradicate the sex diseases. The doctor has a part to play, to which, it is to be hoped, he will rise.

I look upon Dr. Holloway's paper as more far-reaching, for good, than any other paper, that has been read, here, today. Coming from a man, with so many years experience, it emphasizes the fact, that we must look to ourselves for the eradication of acute gonorrhea in the female. We will have eradicated gonorrhea in the female, when the young man no longer finds it necessary to indulge himself, sexually. When he is taught by his father and mother and learns from them this truth, as he learns from the parent other truths, he will know, that it is not only not necessary for man to carnally know an unclean woman, but that it is productive of harm to him—mental harm and moral harm, if not often physical harm. Along with the degradation, that goes with illicit intercourse and follows it, unfitting a young man for higher and more ennobling thought and consideration, there must be taught the boy, the ever-present fear of disease, which destroys his physical body. I repeat, we will cease to have acute gonorrhea in the female, when men cease to infect females.

Gentlemen of the Kentucky Medical Association, you are creators of thought and moulders of public opinion. Fathers look upon sexual indulgence as a necessity. With few exceptions, they think it necessary for the male of the species to indulge himself; they allow their sons to get sex information from whatever source is available. You know how little of exact and proper knowledge is available for the average boy. If the average boy and young man was taught the dire result, that follows in the wake of promiscuous sexual indulgence, there would be less gonorrhea to treat in the female. When we treat it, it must be quickly eradicated. The average young woman is capable of infecting numerous men. One woman infected thirty men at Camp Taylor, in one evening. In our chase after these women, we rounded up a number of them, who have one of the venereal diseases, some had two of the diseases, while a few had all three diseases, in the acute infectious stage, besides being lousy and having so-called "crabs." One soldier carried gonorrhea home to his wife, and she, in turn, through the roller towel, conveyed the disease to her old father-in-law, to her mother-in-law and to her five children, all of whom had gonorrheal ophthalmia. The question is, we have looked upon these diseases too lightly. Let us now join in the fight for the eradication of the three venereal diseases. All hail to Rupert Blue,

who, as Surgeon General of the U. S. Public Health Service, has carried the fight into the ranks of the public.

A. D. Willmoth, Louisville: This subject is so far-reaching and of such vast importance to the abdominal surgeon, who sees so much of the distress that follows it, so much pathology that follows it, that I cannot refrain from saying something on it. If I understood some of the speakers correctly, they left the inference, at least, that an acute gonorrhea in the female was always the result of an acute gonorrhea in the male. Personally, I am of the opinion that is not correct by any means. I have been taught for many years, and I believe the idea was promulgated by Ricord, that many cases of chronic gonorrhea in the male gave no symptoms whatsoever, and the practitioner could not find a trace of gonococci in the urethra to save his life. However, when that young man married and planted on virgin mucosa gonococci, you then had an acute attack of gonorrhea, and the woman in turn reinfects him with an acute attack. How are you going to know when they are well? There are many things that can be brought up in connection with this subject, such as a strong desire of one sex over the other. How are you going to control cohabitation? I think if there is anything in this world that is going to help to control gonorrhea in the female it will be by education, and not by legislation.

I am firmly of the opinion that 75 or 80 per cent of the gynecological operations are the result of gonorrheal infection. You will never be able to legislate copulation out of the world, but you can educate the people, as has been emphasized by Dr. Solomon and the essayist. You can educate the girls and educate the boy to the place where he will fully understand what it means to have this infection; he will fully understand the danger and reproach that will follow in the wake of this infection and will depend no longer upon the druggist and the girl and will not depend upon him unless he has a health certificate before he marries her. I do not believe all cases can be controlled by the government because of the fact it is a venereal disease. How are you going to report cases you do not see, or report the cases you do not know about, and the result will be, there will always be a large number of cases of gonorrhea that will be carried from male to the female and around in various ways. But you can limit the number of cases very largely, I am sure, by following out the rules and regulations laid down by the State Board of Health if every man will report his cases as he sees them. This is an important subject which leads to another important subject. The question is raised, and it is remarked frequently, that every case of puerperal sepsis is carried into a woman's vaginal tract by the accoucheur

during the time he takes care of the woman. Personally, I want to go on record as taking issues with that statement and say that many of these cases are the result of the gonococcus harbored within the pelvis of the female before the accoucheur had anything to do with that case. She has an acute attack and she has so-called puerperal sepsis which is not the result of the honest doctor, but the result of infection implanted by the husband at the time intercourse took place.

Arthur T. McCormack, Louisville: Dr. Holway always presents a live subject in a live way, and he has not departed from his regular standard this afternoon.

The subject of gonorrhea in the female is one of the greatest subjects that can be presented either before a medical or a lay audience today. The investigation of our army draft proved conclusively that we have as many cases of venereal disease in our young men as we have of tuberculosis, and it is a serious menace to the future of the race. I have always been an ardent suffragette myself, because I believe when women by their vote assist in making the law, we will have legislation that will recognize the male prostitute on exactly the same terms as the female one. On the other hand, we amongst ourselves ought to take up these matters very frankly. Why do boys especially go to the corner drug store to get medicine for the treatment of gonorrhea, and girls go nowhere? Because of the utterly bad way in which you and I treat boys and girls who have gonorrhea. The average case of gonorrhea is as badly treated by the average doctor as if it were treated at the drug store or anywhere else, or not treated at all. There is not one case of gonorrhea in a thousand in Kentucky that has been discharged after having been treated where the doctor has the slightest idea that he has resorted to any sort of scientific procedure in the cure of the case. That is your fault, it is my fault. We are discharging cases of gonorrhea every day after treating them as futilely as if painting a picture of a ship on a painted ocean. Cases of gonorrhea are being treated by a great many methods by doctors all over the commonwealth of Kentucky. We are not treating the disease right, and we are not treating it as the serious matter that it is. It is not an infrequent thing for young men coming into offices to be laughed at and made the subject of jokes because of their infection by the men who represent our profession. This should not be done. It is your duty and mine to go into county medical societies to educate the doctors of Kentucky so that they will uphold the standard that we are speaking of here. In the next place it would be interesting to note how many doctors have seen cases of gonorrhea recently in this town and other towns who have failed to report these cases. I want to insist that a man

who fails to report cases of gonorrhea under the law is *particeps criminis*. Such a doctor becomes responsible for the spread of infection by gonorrhea, and until the time comes to recognize that fact we will not get anywhere with this tremendous infection. We are the ones who have charge of the first line of trenches in the fight against venereal diseases, and we should fight it by making the diagnosis correctly. I am satisfied there are few people who have any other disease that compares in seriousness with gonorrheal infection, whether man or woman. Personally, from the experience I had in Panama, where I saw cases of gonorrhea in the female in large numbers treated by most competent gynecologists and surgeons, I am convinced the only way is by complete ablation of the female genital organs when the infection has reached the broad ligaments and tubes.

The sooner we can arrive at the conclusion that it requires radical treatment to remove this disease, and to teach all the women of this country that is what is required. As soon as we have done that we will eradicate the disease, but not until then. When you think of the childless marriages; the homes that are blighted by this disease; when you think of the asylums, the penitentiaries filled with people with this disease, you can have some comprehension and conception of its ravages. We are just finishing a survey of syphilitic infection in the penitentiaries of the state, and we find nearly 80 per cent of the inmates of our penitentiaries are infected with syphilis that do not go to our lectures and hear our discussions.

Our asylums are being filled more and more every year by men and women diseased with syphilis, and it actually threatens the destruction of the race. We know that in the large and best sections of the state the birth rate has decreased far below the death rate. The birth rate is decreasing year by year, and not only from birth control but decreasing largely because of the infection of fathers and mothers with venereal disease.

C. Z. Aud, Cecilia: I cannot resist this opportunity of offering a means of reaching the people in an educational manner. As Councilor during the last year, I made an effort to visit each one of my counties. My program was that the doctors of the county should get together and during the morning session discuss this question, and that the evening session should be devoted to the work from the standpoint of the Boards of Health. I have had the pleasure of having both Dr. Solomon and Dr. Board with me, and I can say to you in my opinion that is the best way to get this subject before the people.

I want to talk to each one of you whether you be a delegate, whether you be a secretary of your county society, or whether you be just an ordi-

nary practitioner, as to the necessity during the next year of having your secretary invite your Councilor to come and have one of these meetings; have the meeting during a time of the year when the roads are good and the people can attend and go over the subject carefully. Have the morning session devoted to a discussion of the subject among the doctors and the best way to get at the people. In the afternoon or evening session get the State Board of Health to do its part. In this way you will reach the people quickly. I do know that these subjects can be discussed before the people in such a modest way that it is not suggestive, and no evil will come from it but much good. It is a crying evil and one that will bring degeneration to the people and the loss of civilization. The history of the world shows, as Dr. Board so well illustrates, that there have been perhaps numerous civilizations as great as ours, and that syphilographers, those in control of feeble-minded institutions, have traced the diseases of the mind to syphilis. If we are not careful about our civilization, our health will become so feeble that we will become maniacs, and we will become Bolsheviks. Russia today is the worst infected of all nations of the earth with syphilis. I beg of you to go home and consult your Councilor, and your Councilor to consult you as to the advisability of keeping you out of trouble and of getting the people well and happy.

Edward Speidel, Louisville: Dr. Holloway in his paper omitted one member of the profession who, at least, should be interested in gonorrhea also, and that is the obstetrician, and he unfortunately meets it in its most virulent and terrible form. It is not uncommon at all to find patients in the last months of gestation infected by their erring husbands with acute gonorrhea, and gonorrhea under these circumstances attacks the woman in a most unfortunate and distressing way. The symptoms of such an infection are very acute—intense, frequent, burning micturition, and the worst feature of the condition is an intense itching that it seems almost impossible to allay. I have had a number of cases of that kind in the last year, so the question is very vivid in my mind.

Unfortunately, there is no question of a cure of the condition during the time the woman is pregnant until the birth of the child. In fact, very little relief can be given the woman. It would be dangerous under these circumstances to paint the vagina or cervix with strong silver solution for fear of opening abrasions and of having avenue of infection after the birth of the child. Argylol solution seems to be slightly effective under such circumstances. The only relief I have been able to give my patients has been from frequent warm douching and most of all through sitz baths.

In another form it shows itself to the obstetrician, a very distressing form, and that is, as a mild form of septic infection in the lying-in period. A woman who has a chronic gonorrhea has negative gonococci in the glands of the cervix. Under the influence of pregnancy these very often become virulent, and after the birth of the child the internal os being open the gonococci are able to invade the uterus, Fallopian tubes, and peritoneum and then we have a gonorrheal puerperal infection, and I would advise all of you in consequence that when you have an elevation of temperature in the lying-in period, to make your diagnosis of the character of the infection by obtaining some of the lochial discharge from the inside of the uterus, and then sending it to your state laboratory, which is so convenient for all of us now, and having a diagnosis made of the particular micro-organism, and in many instances you will often be astonished to find that the gonococcus is at fault.

There is another form of gonorrheal infection that not infrequently occurs in the lying-in period, and that is due to the fact that the husband with gonorrhea contracted during his wife's pregnancy has intercourse with her before the lying-in period is over, and an acute gonorrhea is contracted by the woman under these circumstances. Such a gonorrheal infection is extremely virulent, and in most instances results in an extremely high temperature that is very hard to control and very often leads to death of the woman.

William H. Joyner, East Bernstadt: I wish to relate my experience in one case which came under my observation. It is rather a social than a medical question. A young woman, a prostitute, came to my office and asked me what I thought was the matter with her. She gave a history that any of you would diagnose as gonorrhea. Naturally, I was very frank with her and told her that her infection was, in all probability, gonorrhea. She said, "I thank you," and turned to walk out of the office. I said to her, "Don't you want treatment?" She said, "No, I know something that will cure it." Does this case belong to the urologist, to the obstetrician, or does it belong to myself? Personally, I believe it belongs to the police. (Laughter.)

T. C. Holloway, closing the discussion: I desire to thank the gentlemen for their very full discussion of my paper. From the drift of the discussion there is a little sign of encouragement for those engaged in this work. I believe it indicates a change of viewpoint on part of the medical profession. I realize that Dr. McCormack and you gentlemen would not hesitate to say that the standards with reference to medical matters present in your community are due very largely to your own attitude, to your personal influence. The failure on part of the community

generally to recognize the seriousness of this infection is borne out by the imperfect and trivial manner in which the average physician, as Dr. McCormack truthfully say, handles such a case.

With reference to the great problem which has been presented, it seems to me it is only necessary for the great body of physicians to realize that it is possible to do something about it. I think most of us have contemplated this thing in despair without being able to make any successful headway against it. If we once realize that it is possible to accomplish something, this question could be taken out of the hands of the quasi religious, more or less fanatic people, and be reduced simply to a matter of common sense, to practical health conduct on the part of the community. I daresay the most important piece of legislation passed upon at Frankfort last year was that which gave us a model venereal law, and yet there are not three per cent of the people in Fayette County who know anything about it, or who know what was provided for in that law. I daresay, a great many of the physicians in the State of Kentucky are not familiar with the provisions of the venereal law, and I am quite sure that a considerable percentage of us are not complying with the provisions of that law. Until we, as physicians, do our full duty, we cannot expect a great deal from education or legislation or any other measures; but when we have realized our duty and discharge it fully, I believe educational propaganda will go forward more successfully. Again, I thank you for the marked attention with which you listened to my paper.

Pressure in the Cerebrospinal Fluid.—From study of the pressure at lumbar puncture in 310 cases, Barre and Schrauf estimate that the normal pressure, measured with the Claude manometer, is 20 cm., when the subject is reclining and 40 cm. seated, with the head drooping. Raising the head in the second position sends up the pressure from 5 to 10 cm. They consider every pressure pathologic which is over 25 cm. reclining, and over 45 cm. seated. In order to estimate the pressure in a given case, the position of the patient during the puncture must be specified; also whether he is tranquil or agitated, and whether the pulse varies in frequency or force during the puncture. Their observation suggests further that the difference between the initial and the terminal pressure and the absence of synchronous beats in the arterial pulse might aid in the diagnosis of hypertension in the cerebrospinal fluid. Subarachnoid injection of even relatively large amounts of certain drugs modified very little and only transiently the pressure at lumbar puncture, whether any of the fluid had been withdrawn beforehand or not.

MEASLES*

By G. P. BAILEY, Harlan.

Measles is an epidemic contagious disease. Very few persons reach adult life without contracting it. One attack usually confers immunity. It is highly contagious from the beginning of the invasion and spreads with great rapidity from the patient to all susceptible persons exposed.

The incubation period varies some, generally eleven to fourteen days; a gradual invasion of three or four days with symptoms of acute coryza and a maculo papular eruption which appears first upon the face and spreads slowly over the body and which lasts five or six days. This is followed by a fine bran-like desquamation, which is complete in about a week.

The mortality is low, except among infants and delicate children. The essential cause is yet unknown. It is believed to be due to a micro-organism. Very young infants do not so readily contract measles, but all other children are extremely susceptible.

Epidemics of measles are more frequent and more severe during the winter and spring months and highly contagious from the beginning of the catarrhal symptoms. The lesions are those of the skin and the mucous membranes, chiefly of the respiratory tract. The process in the skin is of an inflammatory character. The changes in the mucous membranes are quite as much a part of the disease as are those of the skin. There is a catarrhal inflammation affecting the conjunctiva, nose, pharynx, larynx, trachea, and large bronchi, which varies in intensity with the severity of the attack.

As a rule, the invasion of measles is gradual, both the fever and catarrhal symptoms increasing steadily up to the appearance of the eruption. The characteristic symptoms of the invasion are those of a severe coryza, suffusion of the eyes, increased lachrymation, photophobia, sneezing, and a discharge from the nose. The hoarse, hard cough indicates that the catarrhal process has involved the pharynx and trachea, as well as the visible mucous membranes. Frequently the patient complains of sore throat, and on inspection there is seen some congestion of the tonsils, fauces and pharynx. On the hard palate are frequently seen small red spots. The constitutional symptoms are indefinite, and may be met with in almost any disease. There is dullness, headache, pains in the back, rarely vomiting or diarrhoea. Drowsiness is a frequent symptom and in exceptional cases in which the inva-

sion is abrupt, is puzzling. There may be a sudden accession of fever with vomiting and convulsions. When the disease prevails epidemically, the invasion is usually sudden, with high fever and pulmonary symptoms which are so severe as to mask everything else until the rash makes its appearance, the case up to that time being often regarded as one of primary pneumonia or influenza.

The duration of the stage of invasion from the beginning of the catarrh until the eruption varies considerably, generally from two to five days. Eruption usually appears on third to fifth day of the disease; in the largest number on the fourth day. As a rule, it is first seen behind the ears, on the neck, or at the roots of the hair over the forehead. It appears as small, dark red spots, which are at first few, scattered and not elevated, resembling flea bites. In twenty-four hours the macules are much more numerous and many of them have become papules. They frequently group themselves in crescentic forms. They are usually separated by areas of normal skin, but where the rash is intense they are frequently coalescent. From the time of its first appearance to the full development of the rash on the face, is usually one to three days. With a full eruption there is considerable swelling of the face, especially about the eyes. On the second day of the rash it begins to appear upon the neck, beneath the chin, the upper part of the chest and back; on the third day the trunk is covered and scattered spots are seen upon the extremities. The rash appears last on the lower extremities and by the time it is fully out upon them it has usually begun to fade from the face. The eruption fades slowly in the order of its appearance, the duration of the rash being from one to six days. The average duration of the infective period is three weeks.

There are many cases in which the rash does not follow the typical course. Instead of spreading gradually, the entire body may be covered in a few hours. The rash may be hemorrhagic which is known as the "black measles," of the older writers. It is in most cases a bad, but not a fatal symptom. The rash may be very faint and of short duration, being scarcely elevated at all. It may consist of very minute papules, closely resembling the rash of scarlet fever. It may be very scanty and late in its appearance, particularly in cases of great severity and hyper-pyrexia, the malignant cases. Temporary cessation of the eruption may occur at any time during the height of the disease and may be due to heart failure.

During the first two days of the eruption,

*Read before the Harlan County Medical Society.

the local and constitutional symptoms increase in severity, both usually reaching their maximum at the time of the full development of the rash upon the face. The skin is swollen, and the seat of intense itching and burning. The eyes are very red and sensitive to light and there is swelling of the conjunctiva with an abundant production of mucus or muco pus, causing the lids to adhere. There is pain on swallowing, also swelling of the glands at the angle of the jaw and maybe in the post-cervical region. The cough is frequent and very annoying. There is anorexia and sometimes diarrhoea, more often from my experience, after the subsidence of the eruption. The tongue is coated, and may show at its margin, enlarged papillae. As the rash fades, the temperature declines rapidly, generally reaching normal in two or three days.

Desquamation begins almost as soon as the rash has subsided, the nature of which is fine, branny scales. Its usual duration is from five to ten days. It may be prolonged for two weeks. During this stage the cough often persists and the eyes remain weak and very sensitive to light. The temperature in uncomplicated measles ranges from about 99 to 104.5 degrees.

The most frequent and most important complication of measles is broncho-pneumonia. Next to this are ileo colitis, otitis, and membranous laryngitis. Rare complications are lobar pneumonia, meningitis and diphtheria. Bronchitis of the large tubes always accompanied by tracheitis, is seen in every case of measles, possibly excepting a few of the very mildest. Gastric disorders are very common and catarrhal stomatitis is present in almost every case of measles. I have in a few cases, seen some serious renal complications but a transient febrile albuminuria is not uncommon. Endocarditis, pericarditis, erysipelas and several skin affections are given as complications which are rare. Scarlet fever, varicella, whooping cough, may occur during measles, but are more likely to precede or follow. Tuberculosis sometimes follows.

Prognosis depends upon the age and previous condition of the patient, the character of the epidemic and the season of the year. Except in children under three years of age, the deaths from measles are few, but in institutions containing young children, no epidemic disease is so fatal.

Measles should be quarantined for at least three weeks and should be continued longer if there is pneumonia, otitis or nasal discharge. Infants and delicate children and those with a strong tendency to pulmonary

disease or to tuberculosis should be protected from exposure. Isolation is very difficult in private practice but exposure should be prevented in all cases if possible. Thorough cleansing and disinfection of the sick room should be done before it is again occupied by children.

Measles is a self-limited disease, and there are no known measures by which it can be aborted, its course shortened or its severity lessened. The indications are to treat the serious symptoms as they arise and as far as possible to prevent complications, which are the principal cause of death. The sick room should be darkened as the eyes are very sensitive during the febrile period. The food should be light, fluid, and given at regular intervals. If the conjunctivitis is severe a solution of boric acid should be dropped in the eyes several times during the day. If the lids should adhere, an ointment of boric acid applied at night. For the very high temperature, I recommend the tepid bath, to be cooled if necessary, to reduce the fever. If the gastric symptoms at first are severe, I give some purgative, preferably the mild chloride mercury, then keep the bowels regular with castor oil and treat the symptoms and the complications.

NEWS ITEMS AND COMMENTS

At the annual meeting of the Western Electro-Therapeutic Association, held in Kansas City, April 18, Dr. Curran Pope, of Louisville, was elected president. During this meeting Dr. Pope held clinics on Exophthalmic Goiter, Paralysis Agitans, Cerebral Arterial Sclerosis, delivered in the evening session an illustrated address on "Some Phases of Hydrotherapy and Manual Massage."

Supernumary Breast on Buttock.—Percy A. Perkins, Memphis, Tenn. (Journal A. M. A., March 19, 1921) cites the case of a man, aged 59, who first began to give serious thought to a tumor on the buttock at about the age of 17 years. At that time, it began secreting a fluid which at times was whitish, but usually of a prune juice color. This took place monthly and lasted only a few days at a time. This secretion caused some inconvenience by wetting the clothes, and it was necessary to wear a pad over it. At the age of 3, the secreting topped. It has never caused any pain or trouble of any kind. No other abnormalities of development were found. The gland on the right buttock was about the size of an orange. It had the sagging appearance of a breast in a woman of the same age. The nipple was well developed, and slightly larger than usual. No tenderness or masses were found.

Kentucky Medical Journal

PUBLISHED MONTHLY BY
THE KENTUCKY MEDICAL ASSOCIATION
Incorporated

Editorial and Business Office, Cor. State and Twelfth Sts.

Entered as second class matter October 22, 1906 at the Postoffice at Bowling Green, Ky., under act of Congress, March 3, 1879.

Subscription Price\$2.00
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Next Meeting Seelbach Hotel
Louisville, September 19, 20, 21, 22, 1921

COUNTY SOCIETY REPORTS

Bath—At the regular meeting of the Bath County Medical Society the following officers were elected: H. E. Gilmore, president; J. K. Wells, vice-president; H. J. Daily, secretary-treasurer; T. P. Gudgeon, A. W. Jones, J. M. Feland, censors; A. W. Walden, delegate.

H. J. DAILY, Secretary.

Bourbon—At the regular meeting of the Bourbon County Medical Society the following officers were elected: C. G. Daugherty, president; J. A. Stoeckinger, vice-president; M. J. Stern, secretary-treasurer; W. C. Ussery, delegate; A. E. Kiser, J. A. Gilkey, W. C. Ussery, censors.

M. J. STERN, Secretary.

Boyd—At the regular meeting of the Boyd County Medical Society the following officers were elected: E. R. Fitch, president; J. L. Richardson, vice-president; A. J. Bryson, secretary; H. S. Swope, treasurer; G. W. Moore, delegate; W. A. Berry, L. M. Prichard, H. S. Swope, censors.

A. J. BRYSON, Secretary.

Bullett—At the regular meeting of the Bullett County Medical Society the following officers were elected: J. G. Dodds, president; G. W. Kirk, vice-president; R. L. Hackworth, secretary-treasurer; S. H. Ridgway, delegate; R. I. Kerr and T. E. Craig, censors.

R. L. HACKWORTH, Secretary.

Carroll—At the regular meeting of the Carroll County Medical Society the following officers were elected: W. S. Golden, president; W. B. Messink, vice-president; F. M. Gaines, secretary-treasurer.

F. M. GAINES, Secretary.

Clinton—At the regular meeting of the Clinton County Medical Society the following officers were elected: J. A. Sloan, president; W. A. Frogge, vice-president; S. W. Bristow, secretary; J. A. Sloan, treasurer; S. F. Stephenson, W. A. Frogge, censors.

S. F. STEPHENSON, Secretary.

Cumberland—At the regular meeting of the Cumberland County Medical Society the following officers were elected: J. E. Boone, president; J. H. Myers, vice-president; J. R. Webb, secretary-treasurer; L. O. Keen, delegate; W. S. Taylor, H. G. Davis, J. G. Talbot, censors.

J. R. WEBB, Secretary.

Fleming—At the regular meeting of the Fleming County Medical Society, April 13, there were present: T. Ribelin, J. B. O'Bannon, J. W. Bel-

lomy, A. M. Wallingford, Jr., J. C. S. Brice, C. R. Garr, C. L. Garr and Charles W. Aitkin.

It was decided to have a special meeting of the society on June 8, at which visiting physicians are expected.

C. L. Garr, A. M. Wallingford, Jr., and C. R. Garr reported cases and the time of the meeting was taken up in profitable discussion of their reports.

The President being absent, Dr. Ribelin was Chairman Pro Tem.

CHAS. W. AITKIN, Secretary.

Harlan—At the regular meeting of the Harlan County Medical Society the following officers were elected: R. F. Jasper, president; G. P. Bailey, vice-president; R. J. Malott, secretary-treasurer.

R. J. MALOTT, Secretary.

Harrison—The Harrison County Medical Society held its regular monthly session at the Elks' club rooms April 4, 1921. Members present: Drs. McIlwain, N. W. Moore, Rees, Wells Martin, Carr, Morgan, W. B. Moore, McDowell, Righter, Bickett, Swinford, Givens and Wyles.

Meeting called to order by the President; minutes of last meeting approved as read.

N. W. Moore reported a case which presented some symptoms of encephalitis lithargica though positive diagnosis had not been made.

J. E. Wells reported case of phlebitis in right leg, followed by a typical attack of labor pneumonia, and during convalescence from pneumonia developed phlebitis in left leg.

G. A. Beckett reported case of obstetrics with transverse position. Shoulder presenting; resorted to decapitation before delivery could be accomplished.

J. F. Morgan reported case of tumor of orbit. M. McDowell read paper on "Goiter." W. B. Moore, J. E. Wells, J. M. Rees, T. M. Righter, G. A. Beckett, N. W. Moore and J. Martin discussed the paper

W B. MOORE, Secretary.

Henry—At the regular meeting of the Henry County Medical Society the following officers were elected: W. W. Leslie, president; W. F. Asbury, vice-president; W. B. Oldham, secretary-treasurer; T. J. Hoover, delegate; J. T. Hartman, Owen Carroll, censors.

W. B. OLDHAM, Secretary.

Jackson—At the annual meeting the following officers were elected: W. B. Hornsby, president; W. R. King, vice-president; G. C. Goodman, secretary; F. E. Denman, treasurer; L. J. Godby, delegate.

G. C. GOODMAN, Secretary.

Laurel—The following officers were elected: J. W. Crook, president; G. S. Brock, vice-president; Oscar Brock, secretary-treasurer; J. W.

Crook, delegate; William Johnson, J. W. Crook, Mack White, censors.

O. D. BROCK, Secretary.

Larue—The following officers were elected: C. L. Williams, president; E. L. Smith, vice-president; Leigh Maupin, secretary-treasurer and delegate.

LEIGH MAUPIN, Secretary.

Letcher—The following officers were elected: J. D. Fitzpatrick, President; Owen Pigman, vice-president; B. C. Bach, secretary-treasurer; J. M. Bentley, delegate; Owen Pigman, P. Y. Purisfull, T. R. Collier, censors.

B. C. BACH, Secretary.

Muhlenburg—At the regular meeting the following officers were elected: J. P. Walton, president; E. L. Gates, vice-president; Clarence Woodburn, secretary-treasurer; B. W. Smock, delegate, J. C. Johnson, alternate; F. K. Foley, Claude Wilson, L. P. Moore, censors.

CLARENCE WOODBURN, Secretary.

Powell—The following officers were elected: J. E. Lemming, president; R. A. Irvine, vice-president; I. W. Johnson, secretary-treasurer and delegate.

I. W. JOHNSON, Secretary.

Robertson—The following officers were elected: E. W. Linville, president; Alton Wells, secretary-treasurer and delegate.

ALTON WELLS, Secretary.

Rockcastle—The following officers were elected: A. G. Lovett, president; W. F. Carter, vice-president; Lee Chestnut, secretary-treasurer; Walker Owens, delegate; W. F. Carter, R. G. Webb, P. H. Lewis, censors.

LEE CHESTNUT, Secretary.

Rowan—The following officers were elected: A. L. Blair, president; L. G. Robbins, vice-president; G. C. Nickell, secretary-treasurer and delegate; T. A. E. Evans, A. L. Blair, R. W. McCleese, censors.

G. C. NICKELL, Secretary.

Shelby—The following officers were elected: E. J. Eversole, president; A. C. Weakley, vice-president; W. H. Nash, secretary-treasurer; E. L. Beard, delegate.

W. H. NASH, Secretary.

Simpson—The following officers were elected: W. H. Williams, president; E. K. Lamb, vice-president; N. C. Witt, secretary-treasurer; W. A. Guthrie, delegate; W. L. Gossett, E. K. Lamb, J. R. Claypool, censors.

N. C. WITT, Secretary.

KENTUCKY MEDICAL JOURNAL

BEING THE JOURNAL OF THE KENTUCKY STATE MEDICAL ASSOCIATION

Published Under the Auspices of the Council

VOL. XIX. 

BOWLING GREEN, KY., JULY, 1921

No. 7

EDITORIAL

OPHTHALMOLOGY AT THE AMERICAN MEDICAL ASSOCIATION.

After fifteen years Boston has again been host of the American Medical Association. The seventy-second annual session took place in this interesting New England City from June 6th to 12th, with a registered attendance of 5437. Boston offers many advantages as a convention city, not only on account of its splendid hotel facilities and its wonderful climatic conditions, but more especially on account of the many points of interest in this history-making part of our country. While the attendance in number was satisfactory the increase over the meeting of 1906 was not in keeping with the general increase in medical association meetings or with the present association membership of 84,971. The attendance from our state was noticeably poor. The writer, who attended the 1906 session, could not help but contrast the attendance of this year with that of fifteen years ago. A large representation of the medical profession of Louisville was present at that time including many who have since gone to their reward, among whom we can recall the names of Wathen, Reynolds, Marvin, Cartilage, Roberts, Vance, Ray, Cheatham, Grant, Gilbert and others.

The opening of the session of 1906 which was presided over by our Dr. Lewis McMurtry, was rather impressive, prayer having been offered by Edward Everett Hale, who at the time was Chaplain of the United States Senate. One of the most noteworthy events of the 1921 meeting, though not officially on the program of the A. M. A., was the presentation by the Boston Surgical Society of a Gold Medal to Dr. Wm. Mayo. This society, which has an active membership of fifty, holds a fund in trust from the proceeds of which a medal is awarded each year to the surgeon contributing most to the advancement of surgery.

Probably the most interesting session of the house of delegates was the one featured by the deliberation over the attitude to be taken regarding the practice of prescribing beer and wine by the medical profession. While it would seem that the right thinking practitioner would resent the placing of the responsibility of deciding who shall have the privilege of securing alcoholic beverages upon the medical profession and would denounce the promiscuous prescriber of liquor, yet it was only after a bitter fight led by Dr. Arthur McCormack that a resolution was adopted condemning the abuse of the liquor law.

A dominant note sounded throughout the session was the new conception on the part of the medical profession regarding publicity, i.e., that the public should be given more information regarding preventive medicine. Apropos to this view Dr. Dwight Murray of Syracuse, N. Y., proposed the establishment of a lay health journal through which the medical profession would undertake to enlighten the lay people on matters of medicine, dealing particularly with preventive medicine, communicable diseases, social hygiene, medical legislation and the like. The Association also pledged its support to President Harding's policy for a separate Government department of Public Welfare and offered to co-operate in the formation of the new Government agency.

The scientific sessions seem to have gained in interest and in attendance probably as a result of the arrangement of non-conflicting sessions of kindred subjects inaugurated last year at the New Orleans Session and continued at Boston. The moving picture and lantern slide demonstrations have grown in popularity as was evidenced in the increasing attendance. They were of a higher standard than in former years and every department of medicine and surgery was represented in a daily continuous program from 9 A. M. to 5 P. M. The commercial exhibit in the spacious hall of the Mechanics Building was of its usual high standard.

At the close of the sessions of the House of Delegates the following officers were elected for 1921-1922:

President-Elect, Dr. Geo. E. DeSchweinitz, Philadelphia, Pa.

Vice-President, Dr. Frank B. Wynn, Indianapolis, Indiana.

Secretary, Dr. Alexander R. Craig, Chicago.

Treasurer, Dr. William Allen Pusey, Chicago.

Speaker of the House of Delegates, Dr. Dwight H. Murray, Syracuse, N. Y.

Vice-Speaker of the House of Delegates, Dr. F. C. Warnshuis, Grand Rapids, Mich.

Board of Trustees, Dr. Frank Billings, Chicago; Dr. Wendell C. Phillip, New York; Dr. Thomas McDavitt, St. Paul, Minn.

Judicial Council, J. N. Hall, Denver, Colo. (1926).

Council on Health and Public Instruction, Victor C. Vaughan, Ann Arbor, Mich. (1926).

Council on Medical Education and Hospitals, Samuel W. Welch, Montgomery, Ala.

Council on Scientific Assembly, John E. Lane, New Haven, Conn., (1926).

The election of Dr. DeSchweinitz to the presidency was not only a fitting compliment to the Section of Ophthalmology, which has done pioneer work in the section meetings of the Association, but it was a well earned tribute to that Master of Ophthalmology who stands out preeminently among the Ophthalmologists of this country by whom he is held in the highest esteem. Dr. DeSchweinitz is recognized as an authority on Ophthalmology in all foreign countries. Not least of his many attributes is his ability to preside over medical bodies which so fits him for the position to which he has been elected. The honor comes at a most opportune time inasmuch as America is to be host to the International Congress of Ophthalmology in the Spring of 1922.

The next Annual Session of the A. M. A. will be held in St. Louis.

The Section of Ophthalmology this year had a more diversified program than usual. Perhaps most time was given to the relation of focal infections to eye diseases. Dr. Frank Billings, of Chicago, and Dr. J. P. Schaeffer, of Philadelphia, participated as guests of the section in a symposium on this subject. While the opinion was voiced by all of those participating in the symposium that there are many instances of unnecessary removal of teeth and tonsils on the part of the over-zealous operators, it was believed equally common for the relation between the cause and effect in focal infections to be overlooked.

Much interest centered in this year's guest of the Ophthalmological Section, Lieut. Col.

Henry Smith of Indian. His operation for the removal of the cataractous lens in capsule which he has performed over 50,000 times requires skill and dexterity which can only be acquired by one who, like Col. Smith, has an abundance of clinical material to perfect his technique, hence there are but few operators in this country who have adopted the so-called Smith-Indian operation as their method of choice. One of the requirements to insure a successful intra-capsular extraction is a well-trained assistant. Col. Smith participated in the discussion of many papers and presented an essay on night blindness.

The Ophthalmological Section elected Dr. Nelson Black of Milwaukee to preside over the session of 1922.

ADOLPH O. PFINGST.

THE EAR, NOSE AND THROAT SECTION OF THE AMERICAN MEDICAL ASSOCIATION.

As usual the Ear, Nose and Throat section of the A. M. A. was largely attended. The actual number registering being 385.

From the time chairman, Dr. Ross H. Skillern called the meeting to order until the last paper had been read the program offered was one of the most scientific and entertaining we have ever had.

Nasal sinuses as local pathological entities and their sequelae were given much space on the program which naturally led to a free discussion. Operative interference in these conditions was considered from all angles with the consensus of opinion leaning to the more conservative methods of attack.

Many deaths incident to the removal of tonsils were reported and a free discussion of this subject followed the reading of a paper on "Pulmonary Abscess in Adults Following Tonsilleectomy" by Dr. Lewis Fisher. The consensus of opinion being that motor driven methods for the administration of ether and the patient's position on the table during the operation, were to a large extent responsible. Many believe, which opinion is in thorough keeping with our own, that the head should be considerably lower than the rest of the body during the operation as this position to a marked degree prevents the inspiration of blood and infected secretion from gaining entrance into the bronchia.

Local and general anesthesia in the removal of tonsils was thoroughly considered with the majority favoring ether as the safer anesthetic. This method being championed by so many with whom we discussed the matter might prejudice one against local anesthesia

as ether is the method of choice in both Boston and New York and naturally these cities were largely represented. Local anesthesia is far from being devoid of danger. While procain is the safe anesthetic many deaths were reported from its use and it is fair to assume that many occurred during the past year which were not reported, which condition led to the continuation of the Committee on Local Anesthesia with the advice that it meet with the section on pharmacology of the A. M. A. with the ultimate idea of procuring a local anaesthetic offering less toxicity than does procain.

Several new instruments were exhibited in the main modifications of the instruments designed by Sluder.

The problem of the hard of hearing and needed methods for the prevention of deafness was given much time. Many voiced the assertion that in children so affected gentle Politzerization and other well recognized methods of treatment should be induced and continued long after the probable cause had been removed.

The pendulum seems to be swinging farther away from conservation in the treatment of diseased tonsils. This is especially noted in the treatment of beginning deafness.

The clinics, as has been our experience at A. M. A. meetings, were not given the thought and consideration that we might expect. But when one considers the time that the local doctors of Boston must have devoted to make this meeting the success that it was we are loath to accuse them of any neglect from this standpoint.

On the whole the meeting of the A. M. A. was one of the most interesting and instructive we have ever attended.

That Boston is an ideal Convention City I am sure we all will agree. As a boy one dreams of Paul Revere, the Boston Tea Party, the Minute Men, Bunker Hill, etc., and with the rare opportunity afforded by Boston's doctors to see the places marked as the beginning of the Revolution cause one to leave the city with much regret.

Dr. J. A. Stucky, of Lexington, was chosen chairman of this section for the ensuing year. This comes as a recognition not only of his ability but of the interest and untiring effort he displayed in making the Ear, Nose and Throat section one of the best and strongest of the Association, and it is a glowing tribute of the high esteem with which he is regarded by his confreres of the A. M. A.

Dr. Thomas E. Carmody, of Denver, was chosen Vice Chairman with the Secretary, Dr. W. B. Chamberlin holding over another year.

CLAUDE T. WOLFE,

ORIGINAL ARTICLES

INFANT FEEDING.*

By JAMES H. PRITCHETT, Louisville.

Among the many causes contributory to infant mortality, the factor of artificial feeding is perhaps the most important. It has been estimated that 85% of all infantile deaths are those artificially fed (Holt, *Journal A. M. A.*, 1910). Davis found that in Boston in 1911, 74% of deaths over two weeks of age, were in the artificially fed and concludes that in Boston the bottle fed infant is six times as likely to die as the breast fed. (Davis, *American Journal Diseases of Children*, 1913, V. 234). This shows us the importance of artificial feeding. It is the purpose of this paper to discuss artificial feeding of the normal infant, for if the normal child is normally fed, the problem is not a difficult one. It is unquestionably true that the majority of artificial feeding cases are under the care of the general practitioner, for this reason it is absolutely imperative that the practitioner have a fairly definite knowledge covering the principles and practice of feeding. It is a well known fact, physicians dislike feeding cases, finding them irksome and uninteresting and many are prone to "pass the buck", usually to the nurse or mother and often the grandmother; it is for this reason that the various proprietary food concerns are enabled to do business. This is said with no disrespect to those physicians who do this, but facts are facts and we must think and deal with them as such.

TYPES OF FEEDING

Unfortunately in the past, the food for babies was calculated in a complicated and mysterious formula, the various schools taught various methods, there was much confusion and it seemed to be the idea to fit the baby to the formula, rather than the formula for the baby. For the most part these old theoretical calculations in which x-y-z & q played a prominent part have been discarded and at present the idea is simplicity and accuracy for the individual infant.

There are two methods of artificial feeding in use at the present day, one which is known as the top-milk method, in which rather a high percentage of fat is used. This method is obsolescent. The writer is informed by excellent authority that the top-milk method is used practically only in Boston. Ped-

*Read before the Kentucky State Medical Association, Lexington, September 27, 28, 29, 30, 1920.

atricians elsewhere have adopted a much simpler method and one that is being used and taught more and more throughout the country. Undoubtedly the high fat has, in the hands of some specialists, proven its worth, but it is not to be recommended on account of its complexities and other minor objections, for it bewilders the mother even though the method has been explained to her. We cannot overlook the fact that when we use a higher fat percentage than four we are likely to have trouble. There is no advantage in the so-called top-milk method, that is not offered by a much simpler one. The method the writer wishes to bring before you is one known as simple dilution, which means that we dilute whole milk, which is fairly constant as to the food elements with a diluent and add a definite amount of carbohydrate and usually an alkali. This method is recommended on account of its simplicity and accuracy and this is what we most desire; for the physician can easily explain the formula or better still, write out how much milk and water and sugar he desires to be used and the mother can quickly and easily prepare the food. Furthermore should the physician so desire he can very easily estimate the caloric value of the food, also, he can tell the percentage of fat, carbohydrate and protein in any formula he may use. Whole milk contains fat, 4 per cent; carbohydrates 4.5 per cent; protein 3.50, mineral, 0.7 per cent. If the milk is diluted with equal parts of water, the percentage of the elements will be one-half the original, that is fat 2 per cent, carbohydrates 2.25 per cent, protein 1.75 per cent. Should the dilution be with three parts water, which is usually as weak a formula as ever needed, then we further reduce the strength of the milk, in other words, as we reduce or increase the diluent thus the strength of the formula is reduced or increased.

It is absolutely essential that there be definite knowledge of milk and its elements and their relations and the role they play in nutrition and metabolism, also it is necessary that the anatomy and physiology of the growing infant be kept in mind. As a matter of course these necessary details cannot be mastered in an hour, nor in several hours, it is a matter of study, thought and application. That infant feeding is non-spectacular and often of no interest the writer agrees, but what of it? It is a part of the field of medicine and surely it is just as important as surgery, obstetrics or medicine. The man who is unwilling to master the few details so necessary, should give up infant feeding.

The milk used in feeding should be as pure and clean as possible; by clean we mean milk

that is from T. B. free cows, that the cows are clean especially at milking time, that the milkmen are clean, likewise, the utensils for receiving the milk. Bacterially speaking, clean milk should contain not more than 10,000 bacteria to the c.c. This is the ideal milk or better known as "certified." Many times such a milk is not obtainable, then we must do the best we can, use the purest milk available, and if there is any doubt as to its purity, pasteurize or boil the milk. There is no objection to boiling the milk. There is no proof whatever that to do so will cause rickets or scurvy. It is slightly more constipating, but the use of orange juice after the third month will overcome this objection.

FAT.

The percentage of fat used in infant feeding is usually from one to four. There are very few cases that really require more than four per cent. It furnishes energy to the body, aids the carbohydrate in its function, it spares protein waste and finally one of its important functions is to increase body resistance. It is well known that a prolonged low fat intake predisposes to infection, as an example a babe fed for a long period on a proprietary food in which the fat is usually lacking is much more likely to contract infection, than the child who has had fat in the food. Because of the high caloric value 9.3 to the gm. less food need be taken, therefore it relieves excessive intestinal digestion and absorption.

CARBOHYDRATES

Of the four elements in milk the sugar is the most important, it is indispensable in nutrition, without it there would be no gain, no protein retention and the body heat would remain subnormal. The carbohydrate is the *sine qua non* in infant feeding. It supplies energy to the tissues, spares nitrogenous waste and assists in the absorption of the fat and without this assistance the end products of fat would be toxic to the body. There is no substitute for carbohydrate, starch, which is one form of carbohydrate is used in the form of barley, that is barley water usually in the strength of three (3) per cent. It is slightly laxative and has some food value, its use is not recommended before the second month. The sugars used in feeding are of three varieties: Lactose, saccharose, maltose. Theoretically, lactose might be said to be the natural sugar to use, since it is normally in mother's milk. It is widely used and it is claimed by many that it is the best form of sugar for infant feeding. There is no proof to show that it is superior to other forms. Saccharose on account of its cheapness is extensively

used, it is sweeter than other sugars and for that reason it is readily taken by the infant. This form of carbohydrate has proven the best sugar for feeding under normal conditions. The third form, maltose, is practically never used in its pure state, as it is difficult to prepare and is very expensive. It is often used in the form of dextrin and maltose. There are preparations on the market such as Dextri-Maltose, Mellin's Food and corn syrup. The writer has had ample opportunity within the past year to try out the various sugars in four institutions where many artificial feeding cases are seen each year. The conclusion was that one form was about as good as another, but in those cases in which there was a tendency to looseness of the bowels, the cane sugar was found to better suit this condition and the maltose preparations were found to prove too laxative in several cases. Several infants refused food with milk sugar and readily took it with cane sugar. It was noticed in a few cases that those fed with the corn syrup gained weight very rapidly. It is questionable whether such rapid gain is desirable. The percentage of carbohydrate used is never more than 7 per cent, usually 6 to 6.5 per cent.

PROTEIN

Protein is present in two forms, casein and lact-albumen, the casein predominates and it is this form that gives us trouble. The protein is the only element in milk that furnishes nitrogen, it is therefore indispensable in the repair and growth of the body. Should the casein cause trouble, we can use either the sodium citrate or bicarbonate, one or two grains to each ounce of milk used in the mixture or lime water 5 to 10 per cent of the total milk used. Boiling the milk is also of value. It is chiefly on account of the protein that we dilute the milk. The percentage in whole milk is 3.5 and according to the proportion of milk to the diluent just so strong is the protein. The average infant shortly after birth can take one-half to one per cent. This is gradually increased according to the ability of the infant to digest it.

SALTS

The role of the salts in infant feeding is an important and complicated one, the metabolism of which is as yet imperfectly understood, certain it is, however, that the various salts are essential to normal growth and development.

APPLICATION OF PRINCIPLES IN FEEDING

The aim in the modification or dilution is not to attempt to correspond exactly to mother's milk, this cannot be done. It is to the individual digestive capacity of the infant that

we must modify the milk, this fact cannot be overlooked. The caloric estimation of the food needed by the infant and the amount actually furnished is of much importance. It is a check on over or under-feeding. The infant on an average needs from 40-50 calories per pound weight; thus, ten pounds would call for 400 to 450 calories of food value in twenty-four hours. The more husky and fat infant needs less food value than the child who is thin. Whole milk furnishes twenty calories to each ounce. Sugar furnishes one hundred and twenty calories to the ounce. If the total food units given by the milk and sugar approximately approach the number of calories needed then we are reasonably sure that the body will gain and do well. Starting artificial feeding we take into consideration the child, as to whether it is over or underweight for its age, also its age and the weight. We begin the feeding with a weak formula and increase as rapidly as the digestive capacity of the infant will permit. Do not overtax at the beginning with too strong a food. A simple way to estimate how much milk will be needed in the twenty-four hours is that for each pound of body weight use one and one-half ounces of milk. Suppose the weight is twelve pounds. The approximate need would be eighteen ounces. We then determine how many feedings will be needed in the twenty-four hours and how many ounces at each feeding. A fairly safe guide is, one to one and one-half ounces, shortly after birth; gradually increased until the number of ounces is eight, which is usually about the seventh or eighth month. Eight ounces is as much as the average infant ever needs at a feeding. A good average is to give one to one and one-half ounces more than the baby is months old up to the eighth month. It is the consensus of opinion that the three-hour interval gives the best results.

The amount of the diluent is determined by the difference between the total mixture and the milk used. The utensils used in preparation of the formula should be absolutely clean. The nursing bottles should be sufficiently wide at the top to permit easy cleaning, the nipple should be boiled before using.

PREPARATION OF FORMULA

The milk is well mixed and the amount for the twenty-four hours' use is measured out; to the diluent, add the desired sugar, then add the lime water if it is to be used; add the milk, and mix thoroughly, pour the number of ounces desired at a feeding into the number of bottles required for twenty-four hours and keep in the ice box until ready to be used. As an example of what has been said, sup-

pose we say that the infant is three months old, the weight is twelve pounds, the calories needing being about 480. We will give four ounces at each feeding, and six feedings in twenty-four hours. The total mixture will be twenty-four ounces, assuming that we use one and one-half ounces to the pound, we would need eighteen ounces of whole milk. The difference between twenty-four and eighteen is six, this represents the amount of water, or barley water. In diluting the milk we have reduced the sugar, so must add a sufficient amount of approximate 6 per cent. In this formula the sugar is reduced to 3.5 per cent. by the addition of one ounce of sugar the carbohydrate percentage is increased to 6.5.

The formula as written would be:

Whole milk	18 oz—360 calories.
Sterile barley water	6 oz
Sugar	1 oz—120 calories.
Total	25 oz—480 calories.
4 oz. feeding; 6 bottles.	

In this formula, as it happens, the caloric need and the caloric value of the food exactly balance. But do not overlook the fact that the strength may be too strong or possibly too weak for the infant, our duty is to see that the formula is properly balanced and that it meets the need of the infant and that it satisfies, consider the general condition, consider the gain or loss each week and be governed accordingly. The writer realizes that perhaps the subject has been presented as if infant feeding was always smooth sailing, such is not the fact, one will encounter many difficulties and problems, some cases will do badly in spite of our best effort. It is the right of every infant to be properly fed. Let us see that every child in Kentucky has this right.

DISCUSSION:

Scott D. Breckinridge, Lexington. I think Dr. Pickett's paper is one of the most valuable we have heard, and I would like to emphasize the point she makes in regard to blood pressure. I believe that we can do more by carefully following blood pressure than with any other one thing in our prenatal care. I think it serves a double purpose. In the first place, you cannot get the blood pressure without the help of the patient. We have been inclined to let the patient bring a specimen of urine to the office for examination; we have not talked to her, and we have not made any observation of her physical condition. We do not know the patient herself. I believe close contact of the physician and patient will bring out points that cannot be brought out by laboratory work or anything else. In following

blood pressure a very important thing to bear in mind, although it is not the sole thing, is that it ordinarily shows toxemia anywhere from ten days to three weeks before the urinary examination itself. In that connection, I do not believe we can put a hard and fast limit on blood pressure as an index of trouble.

In a series of 5000 cases that were originally reported from Boston dispensaries, five or six years ago, they put 140 as the universal danger mark, but they also called attention to the fact that a low blood pressure originally, gradually rising, nearly always meant toxemia. I have seen as definite indications of toxemia in a patient running a systolic pressure of 110, and a gradual rise to 225, as in other patients who had a blood pressure of 140 or over.

Recently, a young woman, 23 years of age, ran a blood pressure of 135 and 145 continuously through pregnancy. Here we had full evidence of toxemia. She was referred to an internist and to other specialists. Finally, the source of toxemia was found not to be in the pregnancy but due to a pyorrhea. So we have to bear in mind the fact that rise of blood pressure is not necessarily due to a toxemia of pregnancy. If we take the blood pressure every two weeks and see more of our patients and determine the conditions that exist, it is more important than following blood pressure alone.

John Rowan Morrison, Louisville. I am neither a pediatrician nor an obstetrician. I am an internist or general practitioner, and it seems to me, these papers are of special value to general practitioners because they have to see most of the 22 cases and have to start the infant right out on his feeding. Both papers have been very instructive.

If something could be done in our state similar to that which has been done in North Carolina, where the public health officer gets men from Boston and Chicago or other cities to deliver lectures to the general practitioner on the methods of infant feeding, a great deal of good could be accomplished, and I know it appeals to us that our county health nurses care for a great many indigent women; they do not go to the better classes, but a great deal can be done for such women. Education will bring great results so far as public health is concerned to the infant which is a growing citizen of the commonwealth. I speak especially of Dr. Pritchett's paper on infant feeding. I have charge of a station of the babies milk fund clinic in Louisville, and it is remarkable how difficult doctors in general seem to think baby feeding is. I believe this is attributable largely to the works of the masters in pediatrics, such as Dr. Rotch and Dr. Holt and a few men of that magnificent type.

They worked out the percentage of fats, sugar, and things like that, and in so doing have com-

plicated matters. They have put out formulæ that look like problems in algebra. It is easy to get down to simpler methods of feeding.

Dr. Pritchett said there are two classes of feeding, the Boston method, and the Chicago method. There are two classes of people, those who inhabit the cities south of Mason and Dixon's line, and those who live north of this line. Those who live south of Mason and Dixon's line eat hot biscuits, while the northern people eat cold bread. They do not eat hot bread or hot biscuits as do the people of the south. Some pediatricians like top milk feeding and claim they get excellent results, and very correctly. On the other hand, those who follow Finkelstein's method of milk dilution also get excellent results. We take one-third milk and two-thirds water, or one half-milk and one-half water. As the babies get older we add two-thirds milk and one-third water.

It is a good thing to look at the diaper. It does not harm you and you can learn a great deal more from that. It is educational. Examining the diaper may be of more advantage to you than the clinical thermometer, as you can tell whether a baby is having too much fat or too much sugar from the diarrhea.

With regard to milk, I want to say that condensed milk is all right for some people, but it is not proper food for a growing infant. I read in a paper on pellagra some time ago a description of an old lady who lived in the south and had this disease. She had six automobiles but lived on tea and biscuits. They have their place, but they are not the proper foods. They will produce marasmus and diseases in children just the same as in people who eat a lot of biscuit and honey are going to have pellagra if there is anything in the food theory of pellagra. If you want to take the paper of Dr. Pritchett and find out how many ounces of milk it is necessary to give a child and to determine the caloric value of milk, you can do so, but personally, I do not believe in feeding babies by caloric methods to determine whether a child is getting enough food or too much. If you have twelve ounces of milk and multiply that by 20 you have 240 calories. If you add an ounce of sugar you have 120 more calories. I am quite sure that is a very important thing.

Philip F. Barbour, Louisville: I am very delighted to hear of a paper on the prenatal care of the child. One surprising lesson to be gotten out of the war was the large proportion of inefficiency in the young men of America. It brought out how many people in this country are suffering from ill health, but it put the problem to us in a very clear way, that our young men should be saved from the many diseases, which made them inefficient. When we analyze the problem, we go back to the child at the school age and we have them systematically examined to prevent their

getting the numerous contagious diseases with their baneful after effects. But we find we must go still further back and study the children in the preschool age, to see that they have the proper nutrition and proper health environment, so that when they come to school, they are strong in health and body. Still, we must go further back to the young infant, who has a right to proper feeding, so that he is not stunted or deformed from his mother's ignorance of the laws of health and hygiene, and now our study takes us still further to the child in utero, for we find infant mortality and morbidity start in the baby before it is born. There is a definite percentage of still born children which is an unnecessary economic loss.

I have been very much interested in Dr. Pickett's paper in which she emphasized the great importance of the proper care of the mother for the sick child and I believe the time is coming, when obstetricians, without lessening the care of the mother, will devote, at least, a certain amount of time to the health of the unborn child and that is the proper thing to do. The work Dr. Pickett has done in the prenatal clinic, at the Louisville City Hospital has been most excellent. It is one of the best clinics that we have there, and it is proper to say that Dr. Pickett is entitled to credit for developing it to the point she has. But, she is emphasizing, and we must all emphasize the fact that the child in utero must be looked upon as a possible citizen, and the health of the child should be guarded in a healthy mother. The two are bound up together, and yet they are individual and separate.

I was glad Dr. Morrison spoke about percentage feeding. I have labored over percentage feeding for a great many years. I used to struggle myself to pick out the percentage of fat, sugar and so forth, and try to make the method plain to the student. I really have forgotten the formula, because I have dropped out of the habit of using them. We look upon milk as simply a combination of three essential foods, and we make up milk dilutions—one-half, one-third, or three quarters, as the case may be, but one must think of milk not as a unit food, but as a composite food. Some children are able to digest milk with a large proportion of fat and sugar, but fat and sugar have a definite purpose of function in the child, and the average child will handle these things according to the possibilities of its own needs and physiology. Some children can handle a great deal of fat, but we cannot feed the child of the South, fat top milk, as it makes them sick. Again, there are many children who can handle sugar very well. Some can take even as large a quantity as occurs in condensed milk and do well with it, but to some it is almost a poison. Some children can handle caseins as well as fats without having trouble. The infant child must

be studied. You must watch the stools and determine what it is that is causing the trouble in the child's digestion. If it is fat curds, skim off three or four ounces of cream from the top of the quart, and when you get down to the quantity the child can digest, gradually increase the fat again.

There is a strong desire on the part of the mother to have their babies fat, and if she has a child that is not growing or gaining as fast as she thinks it ought to, she will refer you probably to some mother whose child is far over weight and complainingly say, "I want my baby to be fat." Some of us are born to be fat, but the fat child is not always the healthy one, and in the long run, the child who averages near normal weight, will be the most successful one, as far as the happiness of the family and the doctor is concerned.

J. W. Kincaid, Catlettsburg: The reason the children of the south do not do well upon top milk is on account of the excessive fat, and the reason the children in the north do well on it is due to the fact that people in a cold climate have to have a good deal of fat to keep up body heat. The Eskimo and Greenlanders live almost exclusively on fats for this reason; it is not probable, therefore, that the difference in the tolerance of high and low percentage of fat in infant feeding is governed by climatic conditions.

John Rowan Morrison, Louisville: No one has spoken of the great advantages in feeding the child on its mother's milk. I want to make a plea for the child to be fed on its mother without taking the child off of the breast. With a little care, with a little attention, and with probably supplemental or complementary feeding the child can be kept on the mother's breast, and after the mother has gotten over the first excitement she can furnish good milk for the child.

S. F. Keffer, Ashland: I would like to say it is just as essential to have good fathers of these babies as to have correct parental care of the mother. If a child has not the proper father, it will never amount to much, regardless of what may be done for the mother.

Palpation and its Classification.—With people who suffer from repeated attacks of auricular flutter, Louis Faugeres Bisnop, New York (*Journal A. M. A.*, March 19, 1921) claims it is good policy to keep a certain amount of digitalis in the system so that an attack may be more quickly controlled when it occurs. Not all attacks of flutter, however, are converted into fibrillation by digitalis. In many cases the attack terminates abruptly on the use of digitalis, and the heart is at once made regular, except, perhaps, for the occurrence of premature contractions for a short time.

THE DIAGNOSIS AND MANAGEMENT OF HYPERTHYROIDISM.*

By C. W. DOWDEN, Louisville.

The diagnosis of hyperthyroidism has heretofore depended chiefly upon three signs—namely, exophthalmos, enlargement of the thyroid gland, and tachycardia. Add to this nervousness, loss of weight, diarrhea, tremor and increased blood pressure and it would seem that the diagnosis was beyond question. True, in the majority of instances it was and is, but how often do we find this entire chain of symptoms, certainly not often, and when we do just what does it mean? It may mean, and usually does, that the toxemia has advanced to a point where medicine is of little avail, and surgical treatment is dangerous. On the other hand, it may offer absolutely no index as to the severity of the toxemia.

At a little later date, and particularly in connection with the examination of young men for the army, the pendulum swung rather too far the other way and tachycardia and extreme nervousness with some tremor of the fingers was quite all that was necessary to diagnose thyrotoxicosis. Many men were rejected with this diagnosis but we now know they were of the type for want of a better name, we now call neuro-circulatory asthenia. It is quite true that some of them were toxic thyroids, but a large majority of them were not.

It is not my purpose to discuss the diagnosis of those cases in which the picture is quite complete because you are familiar with this, although even in this connection we hope to point out certain facts as to the degree of toxemia and especially as to the treatment and as to operability. Our chief purpose, however, is to describe methods by which the earlier cases may be detected, and especially those border line cases that are frequently diagnosed neurasthenia, heart disease, nephritis, tuberculosis, diarrhea, headaches, etc. In my experience we have had patient report with practically all of these diagnoses, when in fact the real condition depends upon disturbance in the thyroid activity.

Before further proceeding it is necessary that we should discuss for a moment in a general way something about the heat regulation of the body. We all depend upon the thermometer and look upon it as the instrument par excellence for information concerning the progress of infectious diseases such as typhoid fever. Has it ever occurred to you

*Read before the Kentucky State Medical Association, Lexington, September 27, 28, 29, 30, 1920.

that an increased temperature does not necessarily mean an increased heat production? It simply means that heat elimination is diminished, and therefore body temperature rises. On the other hand, there are certain febrile conditions in which heat production is increased, but there is no increase in body temperature because heat elimination is also increased. This point can very well be illustrated by boiling a pan of water on a stove. In a little while the water will come to a boil and it will be found that the temperature is 100 degrees. When more coal or wood is heaped upon the fire and it gets so hot that one can scarcely get near it and you know that the heat is increased, yet if you again place the thermometer you will find that the temperature is exactly the same. In other words, the increased heat production has caused increased heat elimination without changing the temperature of the water. Of course if a little salt or other chemicals are added that interfere with heat elimination, then the temperature of the water will rise.

The same principle is applicable to heat production and heat elimination in the body. It is very simple to determine the heat elimination with the thermometer, but just how can heat production be estimated? There are two ways—the direct method consists of placing the patient in a chamber in which the heat he gives off is actually measured by an increase in temperature of a known volume of water flowing through a radiator within this chamber. A large sum of money is required to install such an apparatus and the technical difficulties of operation and the time consumed in determination places it far beyond the reach of the ordinary clinic.

The other method which is applicable for clinical purposes consists of measuring the gas exchange of the patients. Foods burned in the body produce exactly the same amount of heat as when burned in a flame. By burning foods outside of the body in a calorimetric bomb it can be determined how much oxygen is necessary to produce a certain amount of heat and how much carbon dioxide is given off during this process. Therefore, if we know what a patient's gas exchange is by measuring his oxygen requirements and his carbon dioxide production we can figure accurately what his heat production is.

It will readily be seen then, that various foods will cause a variation in heat production as will also body exercise and other factors. To have a standard which is applicable to all cases and conditions then, it is necessary to determine this exchange of gases while the individual is at complete rest. This means that at least ten or more hours shall elapse after taking food before the observation is

started. This is called the post-absorptive condition. Under such conditions the metabolism is quite constant and it is the heat production under such circumstances that we understand as basal metabolism. Since heat production is proportionally to surface of the body, the size of the individual makes no difference whatever since the heat production is calculated per square meter of body surface and this is the same under these conditions whether it be an elephant or a mouse.

The surface area of man can be easily and quickly determined by an ingenious chart devised by DuBois. This all leads up to the fact that Graves' disease and toxic adenomas of the thyroid gland causes the greatest increase in heat production of all diseases, just as most infections manifest themselves by an increase in body temperature. It is quite natural that you should ask, how do we know this? First, from the fact that the pathology of the gland corresponds accurately to the metabolic increase, second, to the fact that in the discovery of thyroxin (which is now conceded to be the activator of the thyroid gland, by Kendall) that in myxedematous individuals the increase in metabolism is controlled absolutely by the quantity of this chemical injected into the body.

So characteristic of thyroid disease are changes in the basal metabolism that it is looked upon as the *sine qua non* of toxic thyroid states, by such men as Plummer, Boothby and Sandiford, DuBois, Means and Aub, Roundtree, Mayo, McGuire, McCaskey, Allard, and others. So constant has been the findings that it is generally conceded that an increase of basal metabolism means hyperthyroidism and a decrease means hypothyroidism. Such diseases as leukemia, pernicious anemia, polycythemia, etc., produces a less striking rise and must be excluded. The fact must not be overlooked either that a single determination is not sufficient.

My experience embraces about seventy determinations of the basal metabolic rate and includes the various types of thyroid disease, several border line cases and several cases of the so-called neuro-circulatory aesthenia. I believe that the results of this investigation will be as interesting to you as it has been to me. I have selected of this number thirty cases representing various degrees of thyrotoxicosis, some the result of toxic adenoma and others the true exophthalmic type. I believe that this differentiation as suggested by Plummer is for all purposes the best and most practical. It is well at this point to describe in a general way the procedure: Patients are instructed to come to the office in the morning without any food having been taken since the night before at the usual evening meal.

After coming to the office, in the case of women they are at first asked to remove all tight clothing and put on a kimona. They are then allowed to rest on a comfortable bed for from thirty minutes to one hour. The apparatus is then carefully tested for leaks, the blood pressure and pulse is accurately taken, and the temperature of the room and the barometric pressure for this locality recorded. The nose-piece is then adjusted and the mouth-piece snugly fit and the patient is allowed to breathe naturally for a matter of two or three minutes, from the air in the room, then the valve is turned thus connecting him with the oxygen from the spirometer and making a closed system of tubes. After ten or fifteen normal breaths the lowest point recorded by the down stroke of the indicator is taken with a stop-watch and this figure recorded. The patient lies very quietly for at least ten minutes at which time the figure on the spirometer scale is again taken by the stop-watch and the first observation is completed. This same procedure is carried out three different times to prevent any error in the loss of oxygen, or anything unusual in the restlessness of the patient.

I shall not attempt to explain the mathematics of this investigation which is quite intricate although easily learned, except to state that the figures all are corrected to 0 degrees centigrade for temperature and to the barometer pressure of 760 mm. which is sea level.

The greatest surprises have come in the comparatively low rates of the few who, from the usual diagnostic signs appeared to be very toxic, and from a still larger number who on account of the absence of the usual diagnostic signs and were doubtful as to the presence of toxemia presented very high rates indicating a high degree of toxicosis. A few others had the extreme nervousness, tachycardia, tremor, loss of weight, carotid bruit, etc., but with perfectly normal metabolic rates.

In the chart before you No. 4, 7, 10 and 12 were referred to me by the Doctors Frank and all had the usual signs of hyperthyroidism consisting of tachycardia, tremor, loss of weight, etc., and all had increased metabolic rates. The patient No. 4 on June 11 of the present year had a metabolic rate of +55 per cent. A partial thyroidectomy was done June 21 and the microscopical diagnosis by Dr. Stuart Graves was chronic inflammation, follicular distension adenoma. On August 19, nearly one month later the basal metabolism rate was +0.79 and the patient had improved in every way.

Patient No. 7 had a metabolic rate of +41.5 before operation and one month after operation the metabolic rate was +25. The tachycardia persisted, however, notwithstanding

the fact that the patient was greatly improved. I am hoping to make a further test on this young lady in the near future.

Patient No. 10 had the usual symptoms of loss of weight, nervousness, tachycardia, swelling of the limbs, and hypertension. The basal metabolic rate which we naturally expected to be high was +19.6 on the tenth of March just before operation. Microscopical description by Dr. Graves was as follows: Predominating picture is increased number of alveoli, colloid retention and focal infiltration with leucocytes, chiefly lymphocytes. Diagnosis: Follicular hyperplasia, chronic inflammation. On March 30 the basal metabolic rate was -24 and the patient was rapidly gaining weight and at this time is bordering on the obese. Another determination of his metabolic rate will be extremely interesting to see whether or not such an increase may be due to a myxedematous condition.

Case No. 12 is practically a repetition of the other three with a basal metabolic rate running +56 and the microscopical diagnosis of the removed thyroid being follicular distension, colloid goitre. The post-operative metabolic rate was not determined.

Case No. 11 is interesting from the fact that it was considered inoperable. The patient, a woman, aged 56, and weighing only 91 pounds, reported for examination June 12 of the present year. The predominating symptom was palpitation of the heart and sour stomach which had started the previous December. She stated that she had a similar attack of the present trouble twenty years ago. The physical examination revealed a hard globular mass over the thyroid isthmus with marked visible pulsation. The pulse rate was 110 and the blood pressure was 150 for the systolic and 60 for the diastolic. There were no eye symptoms but a very marked fine tremor of the fingers with the hand extended. The hemoglobin was 69 per cent with normal red and white count, the lymphocytes running 24.5 per cent. The urine analysis was not significant for this age. The x-ray examination showed two dense shadows in the posterior mediastinum with also a large dense shadow in the thyroid itself indicating calcification. The blood Wassermann was negative. There was practically no response to the hypodermic injection of one-half c.c. epinephrin. The blood sugar in the fasting state was 115 gm per 100 c.c. One and one-half grams of glucose and 2.5 c.c. of water per kilogram of body weight was given and in one hour the blood sugar was 250 mg per 100 c.c. of blood and this same figure persisted at the end of two hours. There was no sugar in the urine during the fasting state, almost complete reduction at the end of the

first hour and a very heavy reduction at the end of the second hour. The basal metabolic rate was $+38$ per cent. It was our opinion that this was an old thyroid adenoma with thyro-toxic symptoms coming on recently and also with marked cardio-vascular phenomena. We advised, therefore, absolute rest in bed, permitting nothing that would cause even the slightest fatigue. X-ray exposures consisting of about two-thirds of an erythema dose were given every five or six days. On August 4 the basal metabolic rate was $+39.63$ and the pulse which had previously ranged from 90 to 120 and quite regular at times was now from 70 to 78 with only occasional irregularity. At this time we decided that there might be a thymus element in the symptoms and the extract of corpus luteum which had been previously given was discontinued and the extract of thymus was started. This seemed to act wonderfully well for a few days, the pulse becoming practically normal. On August 20, however, the basal metabolic rate was $+31.8$ and the pulse was 100 and quite irregular. On September 7 the basal metabolic rate was $+32.9$ and although the pulse was very greatly improved there was still some irregularity and the blood pressure had returned to within normal limits. At no time could this patient take even slight exercise without marked cardio-vascular symptoms. This case corresponds accurately to the thyrotoxic adenomas as described by Plummer, and the results are thoroughly in keeping with the report of cases coming from Snell and Roundtree in their work in the University of Minnesota Medical School, and also from the Mayo Clinic. In other words this is the type of case that is apparently not benefitted by rest in bed and medical treatment. It is well worth knowing also that this case reported without any suspicion of thyroid disturbance.

Another case which presumably falls under the same classification was recently referred to me by Dr. Abell. The complete data is not available, but the predominating symptom was extreme nervousness, tachycardia and loss of weight, with no eye symptoms, no visible signs of thyroid enlargement. It was the type of case that one frequently sees and looks upon as highly neurasthenic, or on account of the loss of weight, low blood pressure, which was 110 in this case, as tuberculous. The metabolic rate for this patient under the proper conditions was $+100.2$, or the highest figure that we have ever obtained. This is No. 2 on the chart.

Cases No. 18 and 19 are extremely interesting from the fact that in neither had thyroid disturbance been suspected and in the case of No. 18 particularly she had been in

a hospital for a number of weeks in a distant city for treatment of heart disease and nervousness. At the age of 14 she had had an attack of heart trouble and now again at 31 practically the same thing with extreme nervousness. Although still obese, weighing 170 pounds, she had lost something like 20 pounds in the last few months. The physical examination revealed no visible enlargement of the thyroid, although on palpation it was easily determined that the right lobe was somewhat enlarged and soft. There was some slight exophthalmos and considerable lagging of the eyelids on looking down. There was a marked fine tremor of the fingers. The blood pressure was 150 for the diastolic and 88 for systolic. The elimination was otherwise negative. The basal metabolic rate was $+84.1$ showing a very high degree of toxicosis. This resembled closely the toxemia from exophthalmic goitre in which hyperplasia of the gland is the predominating pathological picture. Surgery was considered, but it was decided that the rate was entirely too high and that the patient should be given absolute rest with x-ray exposures over the gland until the metabolic rate came within safe figures. This she readily agreed to do. After five days the basal metabolic rate was 44 and the pulse was 72 and regular. The blood pressure was 140. On September 23 which was only last week the basal metabolic rate was $+29$, the pulse was regular, the blood pressure was down and the patient shows every indication of a prompt return to normal without any operative procedure whatever.

No. 19 is very similar in every respect, although the symptoms of nervousness, irregularity of the heart, etc., were even more pronounced. A kidney lesion was suspected on account of the blood pressure which had been ranging from 148 to 170, but the normal blood urea and normal tests for kidney function excluded such a condition and an increased metabolic rate of 24 per cent directed our treatment along proper lines. This consisted of rest with x-ray treatment as in the former case with the result that on September 16 the metabolic rate was 1, the pulse was 82, and on September 22 the metabolic rate was $+5$ with normal pulses. The blood pressure, however, has continued about the same figure notwithstanding the fact that the patient has improved markedly as to headache, weakness, nervousness, etc. No. 8 is a case similar as to diagnostic results, but we have not been able to follow the results of treatment.

A border line case is that of No. 15 in which the patient has long been treated as a neurasthenic with circulation disturbance. The

predominating symptom was nervousness and insomnia with a feeling of general weakness and palpitation of the heart. The weight was practically constant but there was extreme palpitation of the heart varying from 90 to 160 within five minutes time without any irregularity. The blood pressure was 135. There was slight response to epinephrin, the blood sugar fasting was 100 mg. per c.c. of blood, one hour after taking glucose it was 135, and one hour later 214 mg. The urine which was negative to sugar in the fasting state showed a complete reduction of the copper solution at the end of two hours. The basal metabolic rate was 13.7. There were no eye symptoms and apparently no enlargement of the thyroid. We feel confident that this is an early thyrotoxicosis and furthermore with proper rest and treatment the patient will promptly return to normal.

No. 23 is similar in every respect. No. 24 and 26 represent that type which is often taken for hyperthyroidism and yet with normal metabolic rates. No. 24 is particularly interesting. It is a young man, age 28, farmer. His condition dated back to an influenzal attack which was followed by marked tachycardia and general weakness and great loss in weight. Nervousness was also extreme. Pulse rate in the standing position was 152. The blood pressure was 116. There were no eye symptoms but some fullness of the thyroid and a marked tremor of the fingers with the hand extended. There was marked response to an injection of epinephrin, but the sugar tolerance test was negative. The basal metabolism was -14 per cent. With rest and the removal of septic teeth the patient has made a prompt recovery.

No. 26 was also a young man, age 26, who reported with a diagnosis of hyperthyroidism which was based upon tachycardia, loss of weight, extreme nervousness, but without symptoms directly referable to the gland or the eyes. His basal metabolic rate was -7.5. This is evidently the type that we now call neuro-circulatory asthenia. In spite of the fact that the rate was normal the attending physician still insists that it is a case of hyperthyroidism. It is quite evident that any operative procedure in such an individual would not only not improve his condition, but in all probability greatly aggravate the symptoms. There can scarcely be any doubt that many such cases are being subjected to operation without any benefit whatever, and with even an aggravation of symptoms. Naturally, such results attend to discredit the value of operative procedure in the minds of the laymen.

This is probably sufficient to differentiate the different types and to show the results of basal metabolic determinations. Several others shown were border line cases that were referred by surgeons to determine whether or not surgery was indicated. It has been very gratifying to be able to say whether the patient was definitely thyro-toxic or not.

A word as to the sugar tolerance test and the epinephrin or so-called Goeteh test. In my experience neither is reliable. We have found many cases in which sugar tolerance was greatly increased showing high figures at the end of two hours after ingestion of glucose in which the metabolic rate was absolutely normal. We have had other cases in which the metabolic rate was considerably increased with normal figures for sugar tolerance. In a big majority of cases of hyperthyroidism there is a response to the injection of epinephrin in an increased blood pressure, increased pulse rate, tremor, nervousness, etc. This response alone, however, does not spell hyperthyroidism since we have found it fairly constant in most highly nervous individuals. We do believe, however, that it is a fair index as to the way the patient will respond to operative procedure.

A note of warning is probably worth while in the thyroid adenomas. Several cases have been reported and it has happened in my own experience that the iodides will frequently bring about a rather severe toxemia when administered for this condition. It would, therefore, seem advisable to refrain from the use of iodides in those cases exhibiting enlargement of the gland without any increase in the metabolic rate. My conclusions from this study are as follows: First, that an increase of the basal metabolic rate of 10 points or more above the normal means hyperthyroidism if pernicious anemia, leukemia, polycythemia, etc., are excluded. It should also be remembered that menstruation frequently causes a slight rise, even 10 points or more, and that nervous individuals will show a decided rise on one day and the following day after having been accustomed to the apparatus and the surroundings be perfectly normal. This warning is well worth heeding. No. 27 is such a case. Second, no sign or symptom with which we are now familiar is indicative of the degree of toxemia or an index to its future course whether it be treated medically or surgically. Third, determinations of the basal metabolic rate is the only means by which we can differentiate the border line cases. Fourth, dependence upon the epinephrin test or the sugar tolerance test alone are not reliable guides.

GOITER*

By B. F. VAN METER, Lexington.

This is not a review of the evolution of our knowledge of goiter, that would take volumes, but rather a review of the accepted facts, a brief statement of the best we know. I am actuated in my undertaking by the belief that there is confusion in the minds of the profession on the subject. The confusion is due principally to a lack of classification, a multiplicity of terms used to express one and the same thing. Every authority who writes on the subject uses a different classification, different words or terms to describe the symptom complex.

Years ago we all learned to think of Basedow's disease, Graves' disease, as exophthalmic goiter. A little later to think of hyperthyroidism, a term meant to convey the idea of an oversecretion or faulty secretion of the thyroid gland, producing the symptoms described by Basedow and Graves with or without the physical sign of exophthalmus. The symptoms are:

1. Mental excitation.
2. Vasomotor disturbance.
3. Tremor.
4. Mental irritability.
5. Tachycardia.
6. Loss of strength.
7. Cardiac insufficiency.
8. Exophthalmus.
9. Loss of weight.
10. Diarrhoea.
11. Vomiting.
12. Mental depression.

A combination of three or four or more of the symptoms enumerated making a clinical picture called Basedow's Disease, Graves' Disease, exophthalmic goiter, hyperthyroidism, all meaning one and the same thing, over-secretion or diseased secretion of the thyroid gland—most likely it is over-secretion rather than faulty secretion.

Then we learned the term hypothyroidism, the lack of thyroid secretion, this covering all degree of myxedema and cretinism.

Then we come to the term thyrotoxicosis. This is meant in a general way to cover all diseased manifestations emanating from the thyroid, namely, too much, too little, or perverted secretion. "It is my understanding that the word thyrotoxicosis is a very broad term, something like pneumonia. It merely points the malady to the thyroid and it becomes nec-

essary to be more specific. All the early writing on goiter was from the standpoint of symptoms. The classification was undertaken from that standpoint, coupled with the physical sign of exophthalmus.

Generally speaking, the cases are divided into two groups: Simple goiter and exophthalmic goiter—the simple goiter being further divided into cystic, colloid, and tumor growth. As I stated before, no classification has been adopted but I think Plummer's classification, based on a combination of pathology and symptoms, will in time become universally used. His expressions are simple and convey to one's mind an understanding of the conditions actually existing.

When one starts pursuit of goiter all paths lead to the literature emanating from the Mayo Clinic, and principally from the pen of W. J. Mayo, Plummer, Wilson, Kendol, and Sistrunk. Plummer's classification is as follows:

1. Hyperplastic toxic.
2. Hyperplastic non-toxic.
3. Non-hyperplastic toxic.
4. Non-hyperplastic non-toxic.

Of the patients having hyperplastic goiter 99.2 per cent have toxic symptoms, and eight-tenths of 1 per cent have no toxic symptoms but nevertheless are toxic but in too small a degree to give symptoms. Of patients having non-hyperplastic goiter from 20 to 30 per cent have toxic symptoms; 60 to 80 per cent have no toxic symptoms. All exophthalmic goiter belong in the hyperplastic toxic group and the onset of this type is relatively acute, and the consequences of the disease fairly definite. Mental excitation and vasomotor disturbances and tremor are the first symptoms noted. All of the associated facts make it seem certain that this syndrome is attributable to an excess secretion of the thyroid gland. Assuming over-activity of the gland we can point out the action of its product as follows:

1. The effect of small doses continued over a short time is cerebral excitation, vasomotor dilatation, stimulation of the heart, and general metabolism.

2. Larger doses, cerebral irritability, tremor, free perspiration, loss of weight, diminished strength, and cardiac insufficiency.

3. Still larger doses exaggerate the preceding effects, mental depression follows cerebral irritability, nausea, vomiting, and diarrhoea result from doses little short of fatal.

4. Relatively small doses continued over a long period of time give rise to permanent types of damage in the heart muscle, kidneys and liver.

*Read before the Kentucky State Medical Association, Lexington, September 27, 28, 29, 30, 1920.

The degree of acute intoxication is indicated by the symptoms attributable to the nervous system and the cardiac damage is in a broad way indicative of the degree of chronic intoxication. If we assume the same toxin to be active in non-hyperplastic toxic goiter very small doses going over a long period of time, without evidence of acute intoxication, lead to myocardial degeneration. Most of the variations in the course and severity of thyrotoxicosis can be conceived by an equation, the factors of which are: The dose of toxin; the length of its administration, and the general susceptibility of the person to the toxin.

Patients going to operation with non-hyperplastic goiter give a history of having first noticed the goiter at average age of 22 years, and the evidence of intoxication at the average of 36½ years. The corresponding ages for hyperplastic toxic goiter are relatively 32 and 32-and-nine-tenths years. This is a very important point developed out of the enormous material at the Mayo Clinic, and one which I wish you to get clearly in your mind.

Let us consider it another way. In the case of old simple goiter it took an average of 14½ years from the time the goiter was noticed until the time when they seek operation. In the exophthalmic type it was only three and one-half months average time. In this same connection do not lose sight of the fact that the old simple type of goiter, that took 14½ years to become toxic, myocardial damage is more apt to be found than in the more acute cases, who have taken three and one-fourth months to seek operation, and whose symptoms are principally nervous. It must be further remembered that in the chronic cases the severe intoxication sometimes develops suddenly as though it were from dumping into the circulation a supply of stored-up secretion.

The old simple goiter of adolescence, so common at puberty and so often made light of (that we now call non-hyperplastic goiter) which starts as a swollen gland containing water, colloid and gland secretion, very often undergoes a change after some years, which produces a train of symptoms not unlike the worst features of hyperplastic toxic goiter, namely: myocarditis, degeneration of the nerves, nephritis, and general toxemia. These cases are more fatal than the frank hyperplastic toxic goiter cases, more permanent changes having taken place on account of the creeping poison.

Plummer illustrates this point by taking a person, aged 22 years, with a non-hyperplastic goiter (the old simple goiter) and states that this patient has a definite chance, in fact,

a very likely chance of developing a train of symptoms during his 36th year, practically identical to those of hyperplastic toxic goiter. The intoxication from non-hyperplastic goiter may be divided into two merging groups: A group in which the cardiac toxin predominates and the clinical picture closely resembles, and in many instances cannot be differentiated from, the cardiovascular complex resulting from alcohol, leucic, septic, and other well known toxins; and a group more closely approaching the picture of Graves' Disease.

The frequency of hyperplastic and non-hyperplastic goiter out of 2917 cases coming to operation we divide as follows: 42.8 per cent were hyperplastic; 57.2 per cent were non-hyperplastic, and the non-hyperplastic goiter was noted ten years earlier in life than the hyperplastic. There seems to be a widespread impression that the non-hyperplastic goiter of adolescence should not be operated. This is only relatively true. When they do not show definite improvement under rest they should be operated. There is no such thing as a harmless goiter though there are many that appear to be so, 60 to 80 per cent of the non-hyperplastic type have no toxic signs, but they are nevertheless being poisoned. The dose is sufficiently small or the resistance is sufficiently great to forestall signs and symptoms. A few of these cases by their resistance overcome the disease. A far greater number at the average age of 36 years show signs of the poison.

The point can be illustrated by referring to the users of alcohol. All of you have seen many cases of chronic alcoholism, where the patient has taken a number of drinks each day and never a day when he showed signs of drunkenness, but the day comes, after five, ten, twenty, or thirty years, when he consults you, possibly on account of his digestion and you find cirrhosis of the liver and degenerated heart muscle, albumin or casts in his urine. You know that if you withdraw his alcohol, feed and exercise him properly and the destruction of the cells of his vital organs has not been too great, he will show tremendous improvement, and you know further and know it positively, if he had consulted you five years sooner and you had been able to stop his alcohol the breakdown in his vital mechanism would have been forestalled. This is an exact simile to this type of goiter. You all have them in your practice, some of them will overcome the disease but many more will die before their time with a cardiovascular kidney syndrome.

These cases should all be operated before the average age of 36 years and before they

have suffered destruction of cells in their heart, kidneys, and nervous system. The operation in this type of case is practically free from danger when operated on before permanent damage has taken place and the most hazardous of all the types when operated on after too much damage has been done. It cannot be denied that certain patients improve and apparently recover under medical treatment, however, in the beginning of the disease it is impossible to distinguish between the patients who may fall in this group and those who may fall into disaster. Great responsibility is assumed therefore by advising medical treatment in early cases in which thyroidectomy to a practical certainty would prevent the severe conditions where surgery is helpless.

It seems now to be a pretty well established fact, due to the work of Kendol, that all of the manifestations of hyperthyroidism are due to excess secretion of the thyroid gland and not to perverted or diseased secretion. Kendol has isolated in pure crystalline form the active principals of the thyroid. This substance is analagous in the thyroid to adrenalin in the adrenal. It is a definite chemical compound, containing 60 per cent of iodine. It occurs in the thyroids of all animals under both normal and pathologic conditions. It is associated with another iodine compound, which appears to be physiologically inert. The active principals Kendol calls A-iodine and B-iodine. The A-iodine is in small amounts very toxic. The administration of one-sixtieth of a grain daily to a 200-pound healthy athlete will produce in a few days the acute symptoms of exophthalmic goiter. One one-hundred-and-eightieth grain by mouth stimulates the growth and mental activities of cretins, but the best way to give it for cretinism is hypodermically about once a week. The isolation of this A-iodine from the thyroid gland and the experiments carried on with it have proven beyond a doubt that the symptoms in exophthalmic goiter (hyperplastic toxic) are due to excess secretion of the thyroid. The discovery of this A-iodine proves further that the local application of iodine preparations and the giving internally of iodine are positively harmful, rather than curative, but when we remember that the excess activity of the thyroid, comes in waves, lasting from a day to weeks, the waves subsiding and returning, with weeks or at times years intervening, there is no wonder that many medicines and a few serums have had great vogue, any one of which would be popular with a given indi-

vidual who happened to administer it at the time when the wave was about to recede.

There is no specific medication for goiter. The consensus of opinion at the present time is that rest, careful nursing and sedatives, opium heading the list of sedatives, will furnish temporary improvement. If there is no medication that is curative it becomes doubly interesting to inquire as to the results of surgery. What kind of surgery is to be applied to goiter's various phases and what are the immediate and remote results. The application of surgery extends all the way from the simple procedure of injecting the gland with boiling water to the most delicate and highly technical of major operations, the removal of the greater part of the gland. From the operator's standpoint there are some easy cases but as a rule it is no place for the occasional operator, one can't dig or pull them out. It must be a sharp dissection, done with precision in a clean, dry field, with a good exposure. I would set up two large and glowing danger signs and mark them with "*Don'ts*." First, don't operate your case when they are on the crest of a toxic wave, that is, when in or approaching a crisis; second, when you do operate don't gum the field with active hemorrhage or ooze. If you have hemorrhage clear the operating field before undertaking to go further with the operation. There is one fortunate thing connected with goiter operations that does not always apply to other surgery, namely, there is never a time that you can't stop, pack the wound, and return the patient to bed.

It is often a very difficult matter to determine just how toxic a given patient is and how much damage to the vital organs has been done by the disease. It is difficult to decide in certain cases which operation to apply (the ideal always being to remove the greater part of the gland.) The question must then be asked "Will the patient stand the ligation of one superior pole under local anesthesia?" There is no rule of thumb to determine this. Each case must be judged on its merits and the judgement displayed spells the mortality rate.

Roundtree, of Minneapolis, says:

"Metabolism is the basis of life and of all its phenomena. Like Tennyson's 'Brook' it 'goes on forever.' Species are case in various molds, generations appear and disappear, youth is followed by maturity and age, yet through it all, running along on predetermined lines, goes metabolism. Protoplasm is not mere matter. The cell is the origin of energy, the seat of chemical exchange, of growth, of function and of life. The digestion

and assimilation of nutriment, reproduction, growth, inflammation, degeneration, regeneration, exercise of function, motion and emotion are all matters of chemistry. Species, genus and period of existence are incidents determined by heredity, while size, weight and even personal appearance are matters of metabolism. Where life is, metabolism is; and regulating it are the endocrine glands, the glands of internal secretion."

The metabolic rate gives us an indication as to the activity of the goiter at the moment but it gives us no hint as to the destruction in the vital organs that has already taken place. In the early stages of goiter the clinical picture presented by the patient the metabolic rate and the pulse run hand in hand, the symptoms increasing and decreasing as the metabolic rate varies, however, patients do not always present the same clinical picture while carrying similar metabolic rates. A patient with the rate of plus 50 per cent may be in a crisis and a fatal surgical risk while another with the same rate may show a very different clinical picture and be a fair surgical risk. Some patients develop a great tolerance to increased metabolism as well as a great resistance to excess thyroid secretion. In all instances in which a high metabolic rate is associated with symptoms indicative of a high grade toxemia such as nervousness, irritability, cardiac dilatation, high pulse rate and physical weakness, the condition is most serious and non-surgical.

At present the metabolic rate can only be determined in special laboratories with elaborate equipment. There is an indication however, that this will soon be greatly simplified. It is a pretty safe rule in a desperate case where the injection of boiling water has been done, if the reaction is slight it is safe to do a ligation of one of both poles. If a mild reaction follows the ligation of a single pole it is pretty safe, after a week or ten days, to undertake a thyroidectomy. On the other hand, if the reaction is severe from the ligation it is best to do a second ligation after a week or ten days but wait three or four months before undertaking the thyroidectomy. Quite a few patients after the ligation of both superior poles improve so markedly as to refuse further operation but generally speaking they are not cured and they should have a thyroidectomy done while at the height of their improvement and not wait for the relapse that is almost sure to come.

It is a pretty good rule in selecting cases for operation to postpone the operation when in doubt—resort to sedatives and absolute rest. Generally speaking we have a condition

of affairs the opposite from acute abdominal conditions. Here, when in doubt as to the true condition of affairs we often operate and may occasionally do an unnecessary operation but by our misguided effort we do not take away the patient's chance of life, we have explored and acquired knowledge both for ourselves and for the patient at small risk; but not so with a goiter on the crest of a toxic wave. I believe it to be a fact that almost every acute case of thyrotoxicosis can be teased up to a successful radical operation. Often it is necessary to do a ligation of one pole at a time, at intervals of ten days, with the final operation taking place two to six months later. What I have just said does not apply with equal force to the chronic intoxications. In many of them the damage to the kidneys and liver, as well as to the heart muscle is such as to prohibit any surgical procedure, and besides if by chance they should survive the operation, we are but pouring water upon the burning ruins. We put out the fire, but the results are almost negligible and the salvage small. On the other hand when the radical operation is done sufficiently early, before permanent damage has taken place, I know of no surgery where more is accomplished, physically the patient is transformed and often from the viewpoint of the patient the world as well, all the "blue devils" have been annihilated. The ideal operation is the removal of at least three-fifths of the gland, working within the capsule so as to guard against injury to the recurrent laryngeal nerve.

So, in order to get the point of view of the patient, who after all is the final arbiter of our theories, I sent to my first 25 consecutive cases, the following questionnaire:

- "1. Were you benefitted by your operation?
2. If you were benefitted, did it last?
3. Did your operation make you more efficient at your work or occupation?
4. If you were in condition previous to operation would you have operation done?

REMARKS:

Each patient answered all questions in the affirmative and under the heading of "Remarks" was inclined to extravagant expressions of gratitude.

DISCUSSION:

J. A. Stucky, Lexington: I know of no topic that comes before the State Association that will interest vitally every practitioner of medicine more than this. It will even interest the specialist in medicine, for the reason that it deals so intimately with that mysterious function that we

call metabolism. I wish I knew the difference between hypo- and hyper-thyroidism. I wish I knew which was toxic and which was not toxic, and which case is due to this focus of infection, and another to that focus of infection.

I am impressed with the arguments of Dr. Vannmeter and Dr. Dowden, especially in this, that there is no one symptom that will justify a radical procedure. I note with a great deal of pleasure that we "are boxing our compass" and are looking at both sides of the question. Just what thyrotoxicosis is, I do not know. It is a toxemia. What starts that toxemia? I was struck with a remark of Crile, of Cleveland, who has done so much in this line, and William Mayo also who allowed Crile to speak for him. Before the Laryngological Section of the Southern Medical Association Crile made this remark: "Gentlemen, look carefully after the supra and peritonsillar tissue in its relation to infection of the thyroid," and his point was not to remove the tonsil because you could see it or feel it, not because it was there, but because it was a focus of infection. I have almost gotten to be a routine in that I am viewing every tonsil with suspicion, not with the idea of removing it, but with the idea of finding out if it does carry a concealed focus of infection, and that can be found by making a culture taken from the deep crypts.

I think the two papers of this morning have brought all specialists and every phase of medicine just a little bit closer together. We should try to find out just which is the cause and eliminate every possible focus of infection before we resort to the knife, but if the knife is necessary do not wait until vitality is exhausted before resorting to it.

Roscoe S. Plumlee, Smith's Grove: I wish I were able to say as much about the subject of goiter as the opportunity of knowledge of the disease has been afforded me.

Southern Wisconsin is the home of goiter; it is the Switzerland of America. It has been my privilege to have practiced in the southern part of Wisconsin for five years where goiter was numerous, and it seems the people there, the doctors and surgeons, know as little about it as they do here. I have heard Dr. George Keenan read a fine paper on the subject, and also Dr. R. H. Jackson, of Madison, but I never heard a more thorough discussion in that field than I have heard at the hands of Dr. Van Meter and Dr. Dowden of Louisville.

This is a wonderful subject. It has been my privilege to live among it and yet we have no way of treatment of the disease that amounted to anything. It seems to be as meager as it was at first. We used to have to go to Switzerland to find out about goiter, a country of dairying. There has been nothing brought out in the papers on the cause of goiter. In one of the papers

I heard discussed it was alleged that probably there was something in the chemistry of the soil that might have something to do with the cause of these goiters by reason of having traced it to several cases in different families that used water out of the same well. The boys have goiters.

Dr. Dowden brought out the fact that a great many soldiers who were examined were found to have goiter and a number of them were turned down. Dr. Blackburn, of Bowling Green, Kentucky, said they turned down 254 young men from southern Wisconsin and Michigan on account of goiter. Locality has something to do with it.

As to the symptoms, in discussing Dr. Dowden's paper something was said about tachycardia that accompanied goiter and a chronic myocarditis. In that section where the prevailing disease, except goiter, is a catarrhal condition of the mucous membrane and serous membrane, it seems we have a united condition there with the goiters and myocarditis that brings down the power of the heart to a very low state of force, and just what they have to do with each other we know not. But we have the tachycardia; we have the concealed goiters we know not of except by the x-ray, and Dr. Jackson, of Madison, Wisconsin, and others are doing great research work. In fact, the surgeons there are making a special effort to unshield most of the conditions in the goiter cases. They are doing operations under local anesthesia, and they are succeeding at it where it is confined to the thyroid gland.

John W. Scott, Lexington: I am exceedingly glad that Dr. Dowden has called our attention to the difference in the results obtained in the determination of basal metabolism by the measure of interchange of gases and the determination of hyperthyroidism by the use of the sugar tolerance test and epinephrin test. Nevertheless, while they do not run closely together, these tests are available in the hands of a large number of men. While the interchange of gases sounds simple from what Dr. Dowden has said, it requires expensive apparatus, is of great technical difficulty and is not available at present except in the hands of few men, while the sugar test, or, at least, the epinephrin test are available in the hands of everybody. The study of the blood sugar is a more accurate method, but the determination of sugar tolerance as indicated by the time and amount of glycosuria after the ingestion of a large amount of glucose, has value. I do not doubt the accuracy of Dr. Dowden's statement, and take it entirely for granted, but though that is taken for granted it seems to me, other methods should be used at the same time, recognizing their defects, by those to whom the more accurate and difficult methods are not available.

John R. Wathen, Louisville: We have all been more or less interested and greatly instructed by

those most excellent papers by Dr. VanMeter and Dr. Dowden. It is now a little over twenty years since I first did my first goiter operation, and they now number in the hundreds. I have changed my opinion during the succeeding years in a great many ways in regard to the treatment and diagnosis, and to-day we have no settled problems of this sort.

I was very much interested in what was said regarding the tonsils. In those cases where the tonsil has been inflamed or has given trouble, and possibly is the seat of a focal infection, we have often had cases referred to us for the goiter to be removed. It has been my observation, based on several hundred cases of tonsils, most of these people to a certain extent give a history of tonsillar trouble and say they have invariably been worse when the tonsils have been removed and the goiters left. If you take out a tonsil which is the seat of infection, hoping to improve the goiter, you have made the goiter worse. I will admit possibly there are a few cases where the removal of the tonsil will benefit the goiter, but they are very few, and I hesitate to advise to-day the removal of a tonsil hoping to benefit goiter. I will take away the goiter first and have the tonsil attended to later.

In regard to the classification of goiters, if I understood Dr. VanMeter rightly, the original classification by Plummer has been modified. We are dividing toxic goiters into two classes, into toxic adenomas and the exophthalmic. The toxic adenomas are the type usually appearing at the average age of about 48 years, according to Judd and Mayo. These patients give a history of their goiters having existed for ten years or more. The exophthalmic goiters are the type that appear for operation at about 32 years of age and have been existing only about three years. The toxic-adenomas show their effect largely upon the cardiovascular system. This is the type that has no exophthalmos, but only slight adenomatous enlargement. From statistics collected from a large field, we are finding they are not so dangerous as we formerly thought, and the exophthalmic type is still the great problem for us to deal with. I am free to confess that it is hard to say what is best to do in the treatment of exophthalmic goiter. A good deal depends upon the time you see them and the condition of the patient at the time.

There is a great field along the line of Dr. Dowden's work on basal metabolism, and if we study this carefully, we will come to some conclusions that are beneficial. I am losing less cases of exophthalmic goiter on which I operate than I formerly did, because I am less radical in my work. I am doing more pole ligations than I formerly did, hoping to benefit the patients by this method. I think the mistake I made in the past was to operate on these patients at the

wrong time, at the crisis of the disease, when I should have waited. I believe with more pole ligations, with a more careful study of basal metabolism, we will get these patients in better condition and be better prepared to handle them.

B. F. VanMeter (closing the discussion on his part): Do not lose sight of the importance of the so-called non-toxic type of goiter. You will have them in your practice and because they have not given profound symptoms, you are inclined to ignore them. They start as a swollen gland containing watery colloid and gland secretion. This type of so-called non-toxic goiter often undergoes a change at the average age of 36 years, which produces a train of symptoms not unlike the worst features of hyperplastic toxic goiter namely, myocarditis, degeneration of the nerves, nephritis and general toxemia. In this type of goiter the damage is more permanent and less can be accomplished by surgery than in any other type if they are allowed to go without surgery for an average time of fourteen and one-half years and at the same time it is the type of goiter that carries less risk with surgery when operated on before permanent damage.

C. W. Dowden (closing the discussion): I am sorry time did not permit me to bring out many of the points in my paper which were really the crux of the whole situation.

There is one impression I want to correct which was conveyed in the remarks of Dr. Scott and Dr. VanMeter, and that is as to the availability, cost, and difficulty of operation of this respiration apparatus. It is available and is easily within the reach of every county, and I hope before a great while to see these apparatus in every county. I know of nothing that offers such an aid to medical science as the methods of determining metabolism. I will gladly guarantee to teach any man within half a day's time how to use the apparatus accurately, and nothing would give me more pleasure than to see a portable apparatus installed in every county. Nothing would add more to the health and happiness of the people of the state than the installation of one of these instruments.

As to the cost of the apparatus, the whole thing is under three hundred dollars. It is easy to get; the operation is not difficult. Anybody can learn it, and I can think of nothing which would advance the medical profession of Kentucky more than the study of these metabolic disturbances.

To show you the value of this procedure, just four weeks ago we had a woman come to us for the treatment of disease of the thyroid. She had been in a hospital at a distant city, in bed for rest cure. She did not improve. It is true a careful examination revealed no visible signs of enlargement of the thyroid. The gland could be palpated; the eyes were slightly bulging; there

was a moderate degree of tachycardia. She had lost some weight. She had been going through a period of tests for heart disease, for nervous disease, and neurasthenia. Her metabolic rate was plus 85 per cent. She had x-ray exposures over the thymus. At the end of eighteen days the metabolic rate was 29 per cent. At the end of 27 days it was down to 11 per cent., and next week we expect it to be normal. Her tachycardia is gone. She is quite happy. Her nervousness has disappeared. This shows one type of individual, yet the outward signs were not sufficient to make a diagnosis of disease of the thyroid.

CONTROL OF THE MILK SUPPLY*

By J. D. MAGUIRE, Lexington.

The most important duty of a city health department is to prevent the transmission of disease—the prevention of transmission by milk of infant diarrhea, septic sore throat, typhoid fever, tuberculosis, diphtheria and scarlet fever.

The public should be protected from impure milk and milk deficient in food value; also the health department should urge that an abundance of clean milk be produced and likewise a greater consumption of milk by the public.

Milk should be minutely studied from the dairy room to the dining room.

To protect milk consumers, public health officials must devise standards for milk and city ordinances to prevent the transmission of any of these infectious diseases.

Milk standards are, therefore, most essential to efficient milk control.

A safe and sane milk standard, properly enforced, will improve the dairy and eventually the prosperity of the dairyman himself because of better prices for better grades of milk.

The first essential, then, for the control of the milk supply is that the health department be thoroughly equipped with diligent inspectors, sufficient money, a competent bacteriologist and a complete, up-to-date score card and grade card system for records and references.

The solution of the problem of the control of the milk supply is in the fact that milk must be graded just as other commodities are graded. The public should know the food value of milk as well as its bacterial content.

The Health Department of the City of

Lexington, after more than four years' experience with and careful study of milk, is convinced that the grading of milk, combined with efficient inspection of dairy farms, is the most valuable method by which to control the milk supply.

The Board of Health of the City of Lexington has earnestly endeavored to make its grading system as simple and practical as possible. Bacteria and bacterial examinations have occupied much of the time of the Board of Health's monthly meetings. Every phase of the relationship of bacteria to milk has been fully discussed; the significance of bacteria in milk and laboratory examinations by the City Bacteriologist have been considered even unto the minutest detail of the collections of samples from wagons and milk depots. All phases of the relationship of bacteria to milk having been impartially considered, therefore, the most recent Milk Ordinance of the City of Lexington represents the correct place which bacterial examinations should occupy.

The number of bacteria in milk is controlled by three factors:

Dirt;
Temperature;
Age.

Laboratory methods for detecting the specific bacteria of infectious diseases are of little value, because of the difficulties of isolating the specific organism causing the disease.

For the present, the only practical way for protecting milk from infection by specific bacteria, is by veterinary and sanitary inspection and by pasteurization.

The routine laboratory examinations for determining the total numbers of bacteria in milk will indicate the safety of milk. Small numbers of bacteria indicate fresh milk produced under clean conditions and kept cool; large number of bacteria would indicate milk which is dirty, warm or sour. Clinical observations of groups of children fed on milk which contains small numbers of bacteria shows a low death rate; a reduction in infant mortality among our own records and fewer cases of intestinal infections.

The chief objection against pasteurization is that pasteurization is frequently employed to cover filthy methods on the dairy farm, the dairyman becoming careless in his methods when he knows that the milk is to be pasteurized.

In order to dispel the delusion and answer the objections, the Board of Health adopted bacterial standards for raw milk as well as bacterial standards for pasteurized milk. Numerous criticisms and violent ob-

*Read before the Kentucky State Medical Association, Lexington, September 27, 28, 29, 30, 1920.

jections have, at times, been raised by many of the dairymen as to the unreliability of bacterial examinations, but this lack of faith on the dairyman's part in regard to modern laboratory methods, is now somewhat restored by means of the new milk ordinance.

There will, perhaps, always be some variations in the analyses of duplicate samples, due to the fact that the bacteria are not in solution but are floating in the milk clustered together in clumps each of which will count only as a single colony. Variations in bacterial content usually diminish with the numbers of samples analyzed; consequently the Health Officer grades the milk only after three successive samples have been bacterially tested.

The inspections of dairies now becomes secondary to the bacteriological examinations and takes the laboratory as a guide.

If bacterial tests indicate the sanitary conditions of milk, then the bacteriological examinations should precede the dairy inspection because the tests will point out to the dairy inspector the location of the unsanitary milk and the causes of the defects which the laboratory has discovered.

The two essentials, therefore, in the *control of the milk supply* are:

1. The grading system for milk.
2. Efficient inspection of dairies.

DISCUSSION:

C. W. Shaw, Alexandria: The control of the milk supply is one of the most difficult problems confronting the health officer to-day, and I am glad to know that Dr. Maguire has been able to handle it so successfully. In our county we have not had sufficient help to enable us to carry on the work as we should. At the present time we have a full time milk inspector and are doing a more intensive work than at any time in the past. Just what the results are going to be remains to be seen. Dr. Maguire has well said that the milk should be watched from the time it is taken from the cow until it is in the stomach of the baby. Milk is often spoiled after it reaches the front porch of the home, and our duty will not be complete until the mother has been taught the proper care of milk after it comes into her hands. The milk situation with us has changed quite a bit in the last few years. The large dairy in and around the city has given way to the farm dairy, and while it has increased the work of the inspector, I believe it is a step toward better milk, as a large percent of the old dairy men were interested only indirectly in the dairy business, and as a rule, were dirty. The farmer is in the business to produce milk: consequently wants the best

cow he can get; he wants her free from tuberculosis and has her tested; he wants to know that she pays for her keep and has her tested to find out; and as a rule is anxious to give clean milk. He takes kindly to health regulations if approached in the proper way. Our dairy barns are very well equipped. The great trouble is to get the farmers to use the equipment they have and to teach them to be clean. Some men make good dairy men, while some no matter what you do will never produce clean milk and should not be allowed to remain in the business any more than should any man who produces a food unfit for human consumption.

Roscoe S. Plumlee, Smith's Grove: Just a word or two from observation. The Bowman Dairy Company is the largest in the world. The dairy companies of southern Wisconsin and of northern Illinois are together. They were for about three years the producers, and the Bowman Dairy Company is the great distributor of certified milk in Chicago. The Bowman Dairy Company and the producers got together. The dairy men wanted greater prices for their stuff. The producer must produce better and cleaner milk, then the Bowman Company will pay the price which they ask. Fully 75 per cent. of the dairy men belong to the dairy men's association. They demanded of Mr. Bowman three dollars and forty cents a hundred for their milk. They got it. They were willing if they got the price to allow Mr. Bowman to pay enough for a good sanitary inspector. Recently, I do not know how often, they adopted the plan of visiting every dairy in this association, and the producer is getting his pay and Mr. Bowman is getting the milk.

In this country you will find all nationalities engaged in the milk business. The Scandinavians and Swiss, especially, sell good, clean milk. Even a neighboring dairy man will not stand by any man who produces and sells filthy milk. They insist that the milk from dairies must be kept clean, and the health officer as a consequence has very little to do.

Arthur T. McCormack, Louisville: The milk situation is very serious. In years gone by many dairy men have tried to get by with the production of a quality of milk that was utterly miserable, and that has been tried nearly all over the state. Lexington is the one place where they have not lost sight of the necessary standard, and where regulations have been enforced, and Lexington is the only city supplied with good milk, due to the energy and activity largely of Dr. Maguire. We have got to understand clearly that milk with a bacterial count of millions is unfit for human consumption, and even unfit for hogs, and dairy men ought not to be allowed to put such milk on the market. It is

the duty and privilege of the health officer to take the top off of the can, and turn the can upside down right then and there. But the way to understand the subject is to go into the pasteurization plants and see that they are run correctly, they cannot make anything but manure soup out of manure milk, and that is the thing that has been sold to most pasteurizing plants in Kentucky. Hundreds of gallons of milk and rotten cream have been shipped all over the state to the packers organizations. It is miserable stuff. It has to be made over chemically; it cannot be clean, yet it is shipped throughout the country to-day. The Bureau of Chemistry at Washington seems to be powerless in the matter. They condemn a carload of it and have not done anything to broadly correct the matter. We should have this matter at heart because it is serious. We should educate the people in the country until every child gets a quart of milk and every adult gets a quart of milk.

The mountain problem in regard to milk will be answered by the powdered milk which can be handled if people are taught to do it right at the start. The first time they use it, they do not know anything about it. The mountain people get good milk in the cans at reasonable prices and children are fed on it, and if properly handled it will answer the great need in the industrial centers. A number of counties in the state do not raise enough food to feed the population for a week. Canned and powdered milk, as made by the best manufacturers, is a good food product. It is better than the pasteurized milk that is furnished in almost every town in Kentucky.

R. H. Cowley, Berea: You seldom hear it mentioned that in Pasteurized milk only those germs are killed which die at a very low temperature notably those that cause the milk to sour. The spore forming bacilli which include some disease germs are not destroyed. When the Pasteurized milk cannot be kept on ice and in any case when it is kept too long, the spores grow and even though the milk may not smell or taste very bad it may be full of germs and unfit for use. Sour milk, if clean, is perfectly healthful but there is a real danger in Pasteurized milk if it is kept too long.

R. J. Estill, Lexington: Dr. Maguire brought out one point of great interest, and that is the publicity given to the bacterial examination of milk by graphic pictorial charts which appear from time to time in the local newspapers. This has aroused very keen interest among the people in the community and they look with great care for dairies that stand at the top of the list, and select milk from them for their own children. That is an important element in the education of the people, many of whom perhaps

did not know there was good and bad milk. They thought all milk was good.

J. D. Maguire, (closing the discussion): In the five minutes allotted me for closing the discussion it is unfortunate I cannot give you more of my impressions of a recent trip through the golden west from Lexington to San Francisco and British Columbia, and then back to Lexington. In a quick sort of way I gathered these facts: They are taking the milk out of the city again, and are pasteurizing it at fifteen or twenty miles out of the city limits. The farmers are cooperating. You will see large signs along the railroad track. The beet grower, the alfalfa grower, and farmers are getting together, and now it is coming to the point where they have large pasteurizing plants along the railroad track. Milk from the surrounding counties and for ten or fifteen miles is brought to this central plant, owned and conducted by farmers. The milk is pasteurized and shipped into the city to a central milk depot and from there is distributed. As far as I could learn in San Francisco, Denver, Salt Lake, Seattle, Portland, British Columbia, and Vancouver, 85 per cent. of the milk is pasteurized. It seems there are no milk depots in the city for the strict pasteurization of milk. Milk seems to be sold more by weight than in the south.

Dr. Estill brought out a strong point with reference to the bacterial chart giving the bacterial contents of milk, and this chart was published by the Health Department each month, but we have discarded that chart for the present and under the grading system we mention the name of the dairy man and the grade to which his milk belongs. This we believe to be almost as effective as the old time chart, but it is a matter of educating the mothers especially. Our slogan in the Health Department is this: "A safe and clean milk supply for the baby." They are the ones to be protected in taking the most essential food that can be given to them. So we have devoted much time and much labor and much energy in making the milk supply for the babies of Lexington safe and clean.

We have discovered a very simple method of keeping down dust and flies from the dairy farm. That method has been used for four or five years. A simple way of doing it is to pour crude petroleum oil on the floor, and the odor and smell of the oil keeps the flies away. In the barn they are using crude oil on dirty floors, and the bacterial content is being materially reduced.

As to the pasteurizing plants, they are still the problem, and under a recent ordinance which I read to you, each pasteurizing plant must have a self-recording thermometer. These charts are kept for my observation for thirty days. I go around and inspect them. I do not take as gloomy

a view of pasteurized milk as Dr. McCormack does. These men have spent thousands of dollars for a machine and they are really making an effort to make pasteurized milk safe.

I believe the coming milk is remade powdered milk. We have gone over powdered milk carefully and the bacterial content, the fat content, and the solids and total solids have averaged better than the best milk in Lexington.

If you have trouble in feeding babies with pasteurized milk, it has not been properly pasteurized, or with either raw milk or with condensed milk, or different milk foods, try some powdered milk. We are recommending this from the Health Department. You may be surprised at the number of mothers who take an interest in the milk that comes into the City of Lexington. Some days we have a hundred calls in the Health Department in regard to milk and cream. Mothers know that the health of the child depends more on the safety of the milk than any other feeding the child or baby can receive, and we have been laboring with efficient help to sustain the Board of Health of the City of Lexington to make the milk safe for the baby.

THE SIGNIFICANCE OF ELEVATION OF TEMPERATURE.*

By R. JULIAN ESTILL, Lexington.

The recognition of elevation of temperature as an evidence of disease is as old as the art of medicine itself.

Long before the discovery of the modern clinical thermometer as an instrument of precision in measuring degrees of temperature, the ancient and medieval medical men recognized the presence of elevation of temperature by the dry, flushed hot skin and the breaking up of this temperature when perspiration could be induced. Every rise of temperature is due to some disturbance of the complex heat regulating mechanism of the body, pathologically, this may be disturbed in one of three ways.

1. Some mechanical interference with the normal function of the central nervous system—this is not common—an example is seen in the severe, sudden injuries to the nervous system.

2. By interference with heat elimination as is seen in cases of sunstroke—here the rate of chemical change in the tissues is accelerated as shown by the increased excretion of carbonic acid—there follows injury to body protoplasm with breaking down of the proteids

and degenerative changes take place in the body cells.

3. The products of the various microorganisms exert a toxic action on animal protoplasm when introduced into the body, producing various kinds of diseases, the most frequent symptom of this reaction is temperature elevation.

The practitioner of medicine must never lose sight of the fact that elevation of temperature is not in itself a disease entity, but only a symptom of a systemic reaction to disease somewhere in the body and the management of the condition must be not simply empirical treatment to overcome the symptom, but a thorough and systematic examination of the body to discover, if possible, the underlying cause of the elevation of temperature. This is not always easy, indeed it is not always possible, but failure to find a cause means *not* that there is no cause, nor does it permit us to assure the patient that there is no significance to the continued elevation of temperature, but merely means that we have been unable by our methods of procedure to locate a cause for the elevation of temperature.

In reality, the search for the cause of a continued elevation of temperature of an obscure nature, resolves itself into the same procedure as that employed to search out the focus of infection in obscure cases of focal infection, about which we have heard so much of late, and, as in focal infection, a thorough systematic and carefully conducted physical examination, plus all the many helpful laboratory and x-ray aids at our command will usually reward us with the discovery of the cause of the elevation of temperature, then and then only can we have a rational basis for applying our therapy.

One of our teachers at the College of Physicians and Surgeons, in New York, often told our class that doctors make more mistakes in diagnosis from carelessness than from ignorance. This seemed to me then a most extraordinary statement, but the longer I practice medicine and see the very careless and often-times superficial examination that many doctors make of the average patient, the more convinced I become that he was right—I make the statement to the shame of our profession.

For purposes of study we will divide our subject into two parts:

First: Elevation of temperature as a symptom of some evident acute infection or disease. Here the cause of the elevation of temperature is at once, or at least after a short time, demonstrated and is of no further special significance in diagnosis—for example, an

*Read before the Kentucky State Medical Association, Lexington, September 27, 28, 29, 30, 1920.

abscess of any of the soft parts or some of the acute contagious or infectious diseases.

The second group comprises the cases of most importance and often presents a problem difficult of solution, that is, the cases of continued or intermittent elevation of temperature with no apparent cause. It is in these cases that a careful, thorough and oftentimes repeated physical laboratory and x-ray examination is necessary before a definite cause can be determined for the temperature elevation.

As illustrations of this condition we have:

The low grade infections of the renal pelvis common in childhood, the urine may be macroscopically clear and no definite urinary symptoms be present to draw attention to the kidneys as a causative factor. Oftentimes only repeated microscopic urinary examinations will reveal the real cause of the elevation of temperature.

One can readily see the fallacy and danger of passing these children aside with the assurance that "they feel all right" and consequently the fever has no significance. It is in these neglected and untreated cases that later on serious conditions result and treatment may be unable to do more than allay temporarily a condition which early would have readily responded to proper treatment.

Another condition which is one of the most frequent causes of persistent elevation of temperature in children is cervical adenitis, which is secondary to infected, submerged tonsils. Unless one is on the alert, these tonsils and adenoids, the so-called phimosed cases may be easily overlooked, as the tonsils are usually small and do not protrude into the throat at all and careful inspection is necessary to ascertain that the tonsils are honeycombed with infected crypts and a number of slightly enlarged cervical lymph glands, both anterior and posterior chains can be felt upon careful palpation which exhibit very little if any tenderness. These cases, if neglected, go steadily down and marked secondary anaemia with a generally run down condition follows which very much lowers the child's vitality and unless corrected lays the child liable to almost any intercurrent infection which a healthy child can readily throw off entirely or handle with slight reaction, but in these already weakened children may cause a serious illness or even prove fatal.

The same condition is seen in adults where a low grade infection is present in the accessory nasal sinuses.

Another common cause of elevation of temperature in the adult is intestinal fermenta-

tion with indicanuria, coated tongue, headache, languor, and all the train of symptoms which we are familiar with in auto-intoxication of intestinal origin.

And so we could go on throughout the whole category of medical nomenclature of tuberculosis, early typhoid fever, etc., *ad infinitum*, but time forbids and I trust I have gone far enough to drive home to all of us, just one thought, and that is—

I want to make the strongest plea I am capable of making for a careful and thorough examination of all patients who come under our care—for by this means we will uncover many conditions which are very apparent if we will only take the trouble and time to search for them. The patient appreciates it and has the right to demand it, the physician owes it to his patient and to himself and has no right to prescribe for a patient until he has made a complete examination which in the vast majority of cases will reveal the cause and pathology of the condition for which the patient seeks relief. Then and then only can our therapeutics be rationally or intelligently undertaken.

CONCLUSIONS

1. Elevation of temperature is a symptom of disease and not a disease in itself.
2. Carefully conducted, thorough examinations of the patient are indispensable if good work is to be done.
3. Careful examination will reveal the cause and pathology in the vast majority of cases which may seem obscure at first.

DISCUSSION:

C. W. Dowden, Louisville: This is a common subject, yet we all assume to understand the significance of it without a careful analysis of the situation.

I was particularly glad to hear Dr. Estill urge a careful examination of patients and to make the statement that more errors are due to carelessness than to ignorance. I stated in my own paper that a rising temperature had to do with the heat mechanism, not the dissipation of heat, and not heat production. It means that the trouble in an overwhelming number of cases depends upon some infection. These infections are, as he properly stated, difficult to determine, and often an ordinary careful examination will not reveal them. What I mean by that, can be best illustrated by citing a case that came to my notice within the last two weeks. The patient was a young man, a perfect picture of health. He had not lost in strength. So far as physical appearances were concerned, he was a picture of health; yet this young man ran a daily afternoon temperature of 99, 99.5 to 100.

The sinuses, lungs, and gastrointestinal tract were all excluded from a cursory examination by a number of clinicians. How did we find out what was causing this boy's trouble? It was not done by an analysis of the urine, because that had been done by the laboratory at Louisville and by several physicians. The usual thing, when we investigate a condition of that kind, is to send a specimen of urine to the laboratory. We may have obtained a specimen of urine during rest, or after a lot of water was taken early in the morning, and the specimens are not significant at all. What did we do? We did not examine one specimen, but we took 17 specimens extending over three days. In that way we obtained evidence of his working capacity, what was going on during rest, what was going on after eating eggs, after drinking water, and as the result of the examination, in four of the 17 specimens of urine we found cast, albumen, and pus cells. Immediately following that examination we determined his tolerance for salt and water. We found he could handle salt and water perfectly, but why an individual of that age should not take care of certain nitrogenous foods such as eggs, meat, etc., it is hard to explain. We found he was only passing four grams of nitrogen in twenty-four hours when he should have passed twelve or fourteen from the record of his diet. He was asked to cut down on eggs and meat, and at the end of three days his temperature was normal. This case simply shows the value of a careful study of these things, and by a careful study I do not mean a single analysis of the urine, but it is necessary to get specimens under all conditions of activity and conditions of diet in the routine daily life of the individual.

E. B. Bradley, Lexington: I have been very much interested in Dr. Estill's paper because almost every week some one is referred to us for diagnosis on account of a slight morning or afternoon temperature; especially is this true of children. My experience agrees with what Dr. Estill has said, that in many instances we find the cause for the elevation of temperature in the tonsils, particularly in children.

The next most frequent cause for elevation of temperature is to be found in the urinary tract. There is great necessity for repeated examination in these cases, as shown by the case of a child that was brought to me with elevation of temperature in the afternoon for some weeks. The child had not lost in weight. There was a slight history of tuberculosis in the family and I began to feel that I might have a case of tuberculosis of the lungs. Repeated examinations failed to reveal anything suggestive of tuberculosis, but in the child's neck there were one or two small cervical glands, not

much larger than a pea, which could scarcely be felt. I referred the case to Dr. Stucky who reported that there was nothing in the child's tonsils to cause the fever. The child had a normal leukocyte count and normal urine. We examined several specimens of urine. The child went back home, and in two weeks the mother brought him back again, and when he came back it was evident there was something in the pharynx causing the trouble, because one of the glands of the neck had grown larger. I again referred the case to Dr. Stucky. In the first instance he found nothing, and yet the second time he found a pocket of pus in the tonsils which amounted to several drops when he opened up the tonsil. A day or two later, at operation the tonsils were found to be badly infected. They had been sealed over so that it deceived even Dr. Stucky. I felt gratified to think that I suggested that there was something the matter with the tonsils in the first place.

Nothing but a very careful and complete examination will reveal the cause of temperature in some of these obscure cases, and I must confess that in other cases even repeated examinations have failed.

Samuel E. Woody, Louisville: I have been very much interested in this paper. I do not know of anything that we encounter in treating diseases of children that is more troublesome, more humiliating to the physician and more aggravating to the people than a fever persisting without an ascertained cause. I can look back in painful memory to various cases in which I was embarrassed day after day, unable to determine the type of fever, while my patrons were getting more and more exasperated at my failure to do so. I think in most of these cases I have found, the fever to be due oftenest to one of two principal causes; either an infection in the throat, leading to a subacute adenitis that is not always easy to recognize, even in the neck; or to auto-intoxication.

R. Julian Estill, (closing the discussion): I have nothing further to add except to thank the gentlemen for their remarks and to emphasize again that the whole point of the paper is to make a plea for all of us to make careful and repeated examinations. We all know that with a careful examination we do not always find the cause of the trouble, but we have a clear conscience and we feel that we have done our duty, and not to assure the patient there is nothing wrong because we have not found it. We should not hesitate to make a clean breast of it and say that we have gone as far as we can go. We should make a careful examination, and not put ourselves in the class with those doctors who are making mistakes from carelessness rather than from ignorance.

VENEREAL PROPHYLAXIS.*

By W. E. McWILLIAMS, Stanford.

Nowhere in the great domain of surgery and the practice of medicine is the aphorism, "Prevention is better than cure" more fitting and appropriate than when applied to venereal diseases and their manifold sequelae. This is particularly true because the most authentic data pertaining to the history of this hydra headed disease go to prove that, for many reasons, complete and permanent cures are very seldom effected. Prophylaxis, therefore, becomes the pivot upon which the salvation of the unborn generation must hinge.

In the treatment of this subject we would have it distinctly understood that we have largely culled our information from Government pamphlets and other reliable and authoritative sources. Venereal prophylaxis should begin at birth by dropping a 2 per cent solution of silver nitrate in the eyes of the newly born within an hour after birth; and from thence onward every precaution should be used to ward off and shun septic infection. Every public place and many private homes should have individual towels and drinking cups, and all churches should maintain the individual communion service.

We should educate the laity to understand that sexual intercourse is not necessary to contract syphilis or gonorrhea; but that these diseases may be innocently transmitted from one person to another by kissing; by using the same pencil; by wearing the clothing or sleeping in bed with one who is effected with the disease.

Strenuous efforts should be put forth to have laws enacted requiring a physician's certificate of health before a marriage license could be obtained. It should be made mandatory that sex hygiene be taught in all public and private schools and that public lectures upon the subject be given frequently. In our schools there should be well balanced men to lecture the boys and similarly constructed women to lecture the girls upon this very important subject which, to rightly know and understand becomes a bulwark in the moral life of any community; so that he who would willfully spread the germs of these diseases would be regarded as a traitor and a criminal.

As physicians we should have a Wasserman's test made in all cases or suspected cases of syphilis and microscopic tests for gonorrhea and our findings should be promptly re-

ported to our county health officer. Every patient should not only be thoroughly treated but should be given thorough and minute instructions in the matter of how to keep from infecting others. I would suggest as an early or prophylactic treatment for males the following:

Have patient urinate. Wash genitals and adjacent parts with soap and water followed by 1-2000 mercuric chloride solution. Dry parts thoroughly. Inject a 2 per cent protargol solution or a 10 per cent argyrol solution into the urethra; enough to distend it moderately and have patient to retain the solution at least five minutes before expelling it. After this anoint the whole penis and scrotum with a 33 per cent calomel ointment, rubbing in well and exercising special care in seeing that the folds of the frenum, foreskin and scrotum come in for their full share of inunction. Cover genitals with oiled silk or waxed paper allowing same to remain several hours before washing parts. The formula for calomel ointment used in the U. S. Army is very efficient and is as follows:

Calomel	30 parts
Adeps Benzoinatus	65 parts
Cera Alba U. S. P.....	5 parts

In cases of rape and in some others there are occasions for early prophylactic treatment of females and the following is suggested:

Have patient urinate. Place patient in lithotomy position; wash genitals and adjacent parts with soap and water; give a douche of two quarts of sterile water temperature 100 F. followed by two quarts of 1-2000 solution mercuric chloride and wash external parts with the latter. Dry vagina and vulva by sponging. Swab vagina through speculum with a 2 per cent protargol or a 10 per cent argyrol solution freshly made. Be careful in this to reach every fold and especially the posterior vault and external os.

Swab vulva in the same manner. Inject a sufficient quantity of the same solution into the urethra to moderately distend it and direct patient to hold her finger (in a rubber glove) against the meatus to retain the solution for five minutes. Douche the vagina and vulva with a small quantity of sterile water and sponge dry; then apply a 33 per cent calomel ointment to cervix, vagina, vulva and adjacent parts not using more than one dram of ointment in vagina; cover external parts with oiled silk or waxed paper and direct patient to allow ointment to remain for several hours before washing the parts.

In a general way I have endeavored to show the necessity for prophylactic treatment

*Read before the Kentucky State Medical Association, Lexington, September 27, 28, 29, 30, 1920.

in venereal diseases and at the same time to suggest a line of procedure. Too much emphasis cannot be placed upon the necessity of removing the scales from the eyes of the every man and woman so that he might see for himself and not another the constant and threatening danger from infection that the people of this country are daily subjected to. As physicians it is our duty to turn on the light.

NON-SURGICAL DRAINAGE OF THE GALL BLADDER*

By CHARLES G. LUCAS, Louisville.

Of all conditions that the physician is called on to treat, none is more unsatisfactory than disease of the gall bladder. The profession is of one mind as regards stone in this organ and the conscientious practitioner refers the case to the surgeon. But many cases of gall bladder disease exist without stones according to Smithies (1) study of 1,000 surgically demonstrated cases of gall bladder disease: 509, or 50.9 per cent had stones; in 46, or 4.6 per cent the inflamed gall bladder contained altered bile mixed with a sand-like substance; in 434, or 43.4 per cent, neither gall stones, "sand" or malignancy were demonstrable. He says further in the same article, "A working knowledge of the nature and character of the pathologic changes occurring in the gall bladder would appear to be essential for a proper appreciation of the clinical manifestations for which these pathologic alterations may be responsible." It is an unfortunate fact that, both to lay and professional minds, gall bladder pathology means largely late stage affections as gall stones, obstruction, perforation, thickening or fibrous adhesions. The average text book considers cholecystitis in a vague, uncertain way, as though it were *not an ailment second in frequency of all intra-abdominal disease only to lesions of the appendix*. "Commonly, cholelithiasis meets recognition as an acute dramatic abdominal crisis, in which the chief roles are played by colic, chill, fever, sweats and jaundice."

The common practice in treating chronic gall bladder disease may be summed up as rest, diet, local measures, mineral water and drugs. Under such a regime some patients may pass through numerous acute exacerbations, but when the symptoms recur often and become more and more pronounced, the resort to surgery formerly for drainage but latterly for complete removal of the gall bladder

is indicated. Many of these cases pass through the stages of so-called acute indigestion, dietetic indiscretions, gastric upsets, acute gastritis and other diagnoses when a careful examination and study would have shown a beginning inflammation of the gall bladder.

Undoubtedly many of these cases, if studied diligently and carefully and treated intelligently, could be prevented from going on to the stage of stone formation with its many pathological changes. Through the brilliant work of B. B. Vincent Lyon, a method of treatment has been perfected that bids fair to become standard. Lyon (2) following a suggestion of the late S. J. Meltzer, who found that directly douching the duodenum with a solution of magnesium sulphate caused a complete local relaxation of the intestinal wall, and further advised that by means of the duodenal tube, in jaundice and biliary colic, the local application of a 25-per cent solution of magnesium sulphate "might relax the sphincter of the common duct and permit the ejection of bile, and, perhaps, even permit the removal of a calculus of moderate size wedged in the duct in front of the papilla of Vater.

This suggestion of Meltzer's was taken up at once by Lyon, and in a great many observations, I think he has definitely proved that the assumption of Meltzer was correct. To quote Lyon: "We have proved and are now in a position to demonstrate that Meltzer's assumption is correct—the installation directly into the duodenum of magnesium sulphate, in solutions of various strengths and in various amounts, is followed shortly afterwards (within two to fifteen minutes in most cases) by the evacuation of bile into the duodenum, which can be aspirated by the syringe or the vacuum bottle. Magnesium sulphate appears to be a chemical messenger (hormone) which has the ability not only to relax the sphincter of the common duct and thereby drain the bile into the ducts, but also, simultaneously, to cause the gall bladder to be compressed and to empty its contents. Our observations have convinced us of the soundness of the theory of Meltzer's law of contrary innervation as applied to the gall bladder and biliary passages.

"Magnesium sulphate, however, is not the only chemical excitant which is capable of producing this action of the biliary apparatus. Our studies have shown that there are others which are capable of a similar action and which will be reported later on. The procedure has gradually taught us that it is possible to segregate and study, cytologically and bacteriologically, not only bile from the gall bladder but also bile freshly secreted from the liver itself. It has taught us that we can

*Read before the Jefferson County Medical Society.

differentiate within reasonable certainty between diseases of the various components of the biliary system, that is, that we can make a differential diagnosis between cholecystitis, cholelithiasis and choledochitis in a more scientific manner than by any other method yet advanced."

The method of drainage is as follows: The work must be done with the patient fasting. Usually, I have them come in the morning before breakfast. The mouth is thoroughly washed and the throat gargled with a solution of potassium permanganate, one grain to two ounces of water. A sterile duodenal tube with the Lyon tip, which I have found the most satisfactory of the various tips, is now introduced. I have encountered little or no difficulty in the introduction—even less so than with the ordinary stomach tube. After the tip has reached the stomach, the aspirator syringe is carefully applied and any fasting contents withdrawn for examination. The stomach is then washed out with sterile water and after the return flow is clear, a dilute solution of zinc chloride is introduced and after recovering, the stomach lavaged once more with sterile water and then 250 c.c. of permanganate of potassium, 1-10,000, is introduced. After this is returned, the stomach is again lavaged. The patient then assumes the recumbent posture, turns on the right side and is instructed to slowly swallow the tube to the third mark, taking twenty to thirty minutes to do so. Usually at the end of this time, the tip of the tube has reached the duodenum. In several of my cases, the tube did not pass beyond the pylorus—in two, because of pylorospasm and in two others, the tube had coiled up in the stomach as proven by the fluoroscope. At times, raising the foot of the couch or placing pillows under the hips has seemed to aid its passage. The proof of the passage of the tube can be shown in various ways—by the character of the aspirated fluid, the so-called duodenal "tug" and the fact that water, milk, or any colored fluid cannot be immediately aspirated. In one case, in a professional colleague, the passage through the pylorus was evidenced by a gush of air through the tube. After being sure the tube has passed, a syringe full of air is injected through the tube to balloon the duodenum. The first sterile vacuum bottle is then attached. As a rule, in the healthy duodenum, the first fluid should be bile free, syrupy and stringy in consistence but under pathological conditions, many variations are found. At this point, the bottle is detached and 75 mls. of a 25-per-cent sterile solution of magnesium sulphate introduced. I have made it a practice to introduce the solution by gravity in the majority of cases.

The bottle is again attached and aspiration started. In from one to fifteen minutes the return flow begins—first, the magnesium solution is partly returned and then the bile, diluted by this solution, followed in varying lengths of time, by the darker bile. This can be seen through the window in the tube and when the deep yellow bile begins to show, the second vacuum bottle is attached. The bile continues to flow intermittently, becomes darker and more viscid and after recovering from 30 to 166 mls., in Lyon's own experience, is followed by a light lemon-colored fluid, lacking the viscosity of the second bile, which is collected in a third bottle.

The interesting question is—where do these different colored biles come from? I think that Lyon's idea is correct: The first bile comes from the common duct; the second, from the gall bladder itself and the clear lemon-colored fluid last removed from the liver. That the first bile comes from the duct itself I think we will all admit: to prove that the second comes from the gall bladder, I desire to quote the following from one of Lyon's articles (3):

"My reason for believing it is derived in large part from the gall bladder itself are four:

"(1.) Because I believe that Meltzer's law of contrary innervation as applied to biliary apparatus is a correct one and is based upon a sensible interpretation of the most probable mechanism of the physiological storage and discharge of bile, supported by the experimental observations already recited, and which I have had opportunity to confirm by my clinical experimental studies. Now, if this law of contrary innervation as applied to the biliary system is a tenable one, and if the action of magnesium sulphate serves to relax the tonus of the sphincter of the duct, then it must also serve to contract the gall bladder walls and cause it to expel its contents, wholly or in part, depending on the one hand on the tonicity possessed by any given gall bladder wall and upon whether its cystic duct is patulous, and on the other hand upon the length of time in which the impulse to gall bladder contraction and sphincter relaxation continues to be maintained.

"(2.) My second reason lies in the fact that the color and viscosity of this second bile indicates a higher concentration and strongly suggests it as coming from its storage chamber within the gall bladder; that in certain pathological cases (cholecystitis and high-grade biliary stasis) this bile is a thick, sometimes almost tarry, greenish-black, of the consistency that we have all of us seen scooped out of the gall bladder; that its cytology in health, but far oftener in diseased states,

shows a large amount of desquamated columnar epithelial cells deeply bile stained, as if they had lain in contact with concentrated bile for some time. On occasions I have recovered bile-stained columnar epithelium in such massed abundance that they gave a ridged appearance such as the reticulated folds of the gall bladder mucosa possesses. Furthermore, in cases of clinically suspected cholecystitis it is in this bile that appear by far the larger number of mucopurulent flakes, rich in pus cells and inflammatory debris and often swarming with bacteria, and lastly because the microscopy of this second bile finds normally the larger deposition of bile crystals. In several calculi cases that have been operatively (or otherwise) confirmed, bile crystals occurred in such abundance as to give a gritty or sandy feel to the bile when rubbed with the finger. This observation, together with one other that I shall mention later, offers the most practical differential inference as to the presence of potential or present cholelithiasis.

"(3.) My third reason for believing that this second bile is derived largely from the gall bladder lies in the fact that unless we account for it as gall bladder bile we must account for the presence of from one to (in certain cases) nearly six ounces of this darker colored and more concentrated bile as coming from somewhere between the common duct sphincter and the secreting cells of the liver. Now how much bile do you suppose the common and hepatic ducts can contain in their total length of $8\frac{1}{4}$ inches and their average diameter of one-fourth inch? Surely it is unlikely that they could hold 90 to 150 mls. At any rate, if this second bile is *not* from the gall bladder the burden of proof will rest with the opponents to my theory as to whence it is derived.

"(4.) My fourth reason, and I feel it is the strongest, for believing that this second type of darker yellow and more viscid bile is actually coming in large part from the gall bladder lies in this (I think) convincing fact, namely, that in the cholecystectomized patients that I have studied postoperatively, some ten or more cases, I find, (a) that I never recover the second type of dark bile but pass immediately from the light golden-yellow or relatively more concentrated common duct bile to the light lemon-yellow and limpid bile that I believe is freshly secreted liver bile and collectible for a long period as rapidly as it is secreted, and (b) I find that (in this cholecystectomized group) in the larger number of instances bile is continuously entering the duodenum in the fasting stomach and duodenal state, indicating that the duct sphincter is in a state of inhibited tonus, probably permanently so, since the antagonistic or contrary in-

nervation has been cut when the gall bladder was removed.

(5.) I might add a fifth reason, to the effect that in my post-operative group of cholecystostomized patients upon whom this non-surgical method has been practiced (because the length of time over which surgical drainage would be maintained has not been sufficient to allay the catarrhal inflammation or to arrest the infection) that is in this group, together with a group of non-operated patients with cholecystitis or with gall bladder biliary stasis, I have seen this second type bile, easily demonstrable as pathologic, gradually clear up and return to a more normal appearance under bi-weekly drainage by this method."

In some cases, after a variable amount of dark B bile has been recovered the light lemon-colored bile follows. A second injection of the magnesium solution may again cause the atonic gall bladder to contract and more B bile to be expelled. In one case of acute jaundice, in the sixth treatment, this occurred. Again, in another atonic gall bladder, in which only duodenal secretion with light lemon-colored bile C had been recovered, the third injection of 50 mls. of the magnesium evidently caused more vigorous contractions of the gall bladder as several masses of thick mucus passed through the tube followed by four ounces of dirty brownish bile with decided relief of symptoms.

Following the treatments, I have introduced 250 mls. of Jutte's solution, warmed, very slowly. Lyon advocated the use of Ringer's solution reinforced by a one-fourth to one-half per cent of sodium sulphate. The patient is given a cup of hot bouillon or tea after withdrawal of the tube.

The cytological, chemical and bacteriological examination must be done promptly after removal of the bile. Much valuable information is gained thereby. For differential diagnosis, it is necessary that these studies be carried out, and Lyon believes that by such studies, it is possible to determine the source of maximum infection. In quite a number of operated cases, he has been able, by means of this method, to demonstrate that the same infecting organisms remained in the bile tract.

Through the kindness of members of the senior class of the Medical Department of the University, I have been able to demonstrate this method of draining the gall bladder in several normal cases. In these cases, the first or A fluid was clear; the B fluid was of dark lemon color interspersed with layers of cloudy fluid. This is due to spurts of acid chyme passing from the stomach to the duodenum. On one case, a sub acid one, I was able to produce this cloudiness by adding a few drops

of a 0.5 per cent solution of HCl to the clear bile.

In what class of cases could we expect results from this treatment? In catarrhal jaundice, in low grade, early cholecystitis, cholechochitis, and these cases where the patients condition does not permit of surgical interference. Even in cholelithiasis very small stones have been passed through the tube and, in some cases, larger ones found on examining the stools carefully, following treatment. Lyon refers to the importance of the study of atony of the gall bladder as one of the earlier phases of gall bladder disease and the forerunner of gall stones and gall bladder infections. I refer you to his original paper for a full discussion on this subject. In my own experience, while not large, I have been impressed with the real improvement that has taken place in those cases, particularly where I have been able to recover from four to six ounces of B bile. The complexion becomes clear, the appetite returns and the bowels, as a rule, move regularly even with one treatment. One patient gained twenty pounds in six months with four treatments and has not taken a dose of medicine in the meantime. In two cases of undoubted gall stones where operation was refused, both patients have done well. In one case where cholecystectomy had been done nineteen months previously, seven ounces of thick mucoid material was removed from an evidently distended common duct with relief of all symptoms. The limit of time does not permit me to go into further details but I am convinced that the method opens a great field. I believe we will find that Lyon was right—that we have not paid enough attention to that condition called "biliousness." I am now treating a number of cases that may be classed under that rather indefinite term that I hope to report on later. I have been impressed with the fact that in the majority of cases in which I have followed this method, the bowels have become regular. I believe we will yet find that certain forms of constipation may be relieved by systematic drainage.

In treating duodenal ulcer cases by duodenal feeding, Lyon now makes it a rule to drain the gall bladder once a week to prevent the bile from becoming static. I had the opportunity of seeing several of his cases in which this was being done and was impressed with his results. He also advocates that all convalescent typhoid cases be studied by this method both to determine or prevent the carriers and by drainage to prevent the development of serious gall bladder disease later. The possibilities of this method in investigating diabetes is a large one. As yet, no re-

ports have been made. Personally, I have only tried it in one case, when I first began to use the duodenal tube for this purpose.

A very interesting article by Brown (4) which lately appeared concerns the results of more than 200 observations in 125 cases. In his work he considered 80 mls. and over of gall-bladder bile, as an evidence of stasis. His summary is as follows:

"The direct examination of aspirated bile, by means of the Meltzer-Lyon method, is of great value in the diagnosis of early cholecystitis. This group is an important one, averaging twenty-three per cent of all gall bladder cases presented for examination. The fresh bile shows definite evidence of infection: Cultures are usually positive. The value of the bile examination grows less as the cholecystitis becomes more chronic. In the later lesions, the bile may present a normal appearance: Cultures are usually negative.

"The diagnosis of the early acute cases is of extreme importance. These cases progress to the more pronounced gall-bladder lesions, as the strawberry gall bladder, empyema and gall stones.

"The clinical signs and symptoms are usually slight in this early group. Vague gastric disturbance, chronic indigestion or minor colic attacks usually bring these cases to the physician.

"The surgeon, on exploration, usually fails to incriminate this type of gall bladder. Absence of thickening with no change in color of the wall of the gall bladder, would seem to justify his conclusion. The finding of infected bile by duodenal drainage affords the surgeon the definite data that he needs when confronted with the operative solution of these problems."

At the recent meeting of the Southern Medical Association, Dr. Sidney K. Simon, of New Orleans, in a paper on this subject reported a case of an elderly woman, the subject of an acute cholecystitis with fever, albumin and casts, broken compensation and a blood count of 28,000. She was an unfavorable surgical risk but after introducing the tube, which remained in position for over forty-eight hours, the gall bladder was drained four times during this period and duodenal feeding kept up for the first two days. At this time, the blood count had fallen to 9,000, the fever had disappeared and the patient was comfortable. She was allowed to go home after three weeks in the hospital and left in very good condition.

It is not expected that this procedure will take the place of surgery, but as these cases are studied more closely by this method, it will be possible in the future to prevent many

of the changes that require surgery. Occasionally, following surgery, these patients develop symptoms and it is in this class that something may be done. If nature can be assisted in restoring function before the period when the knife becomes necessary, much will have been accomplished.

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2. Lyons, B. B. Vincent: *American Journal of the Medical Sciences*, Oct. 1920, Vol. CLIX., pp. 515.
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DISCUSSION:

Curran Pope: I have practiced duodenal drainage approximately one thousand times and in each instance the material thus obtained has been subjected to careful general, ocular and microscopical examination. I have been using the duodenal tube ever since Dr. Einhorn introduced its use. Prior to the introduction of the method of Lyons I used the Einhorn method for diagnosis and treatment; but since the introduction of the Lyon method, I have practically employed it in all cases. I prefer the Lyon method for removing the duodenal contents and bile, but still use Einhorn's duodenal digestive tubes for testing the ferments.

I cannot do otherwise than compliment Dr. Lucas on his very excellent paper; but it seems to me a few points in regard to the use of this method might be further elaborated. Personally, I have been able, by patience and persistence, sometimes for twenty-four hours, to get the tube through the pylorus. I have had two cases in which there was partial obstruction for food over long periods of time comparatively speaking (six or seven months) in whom I succeeded in passing the tube with resulting benefit to the patients. I allowed the tube to remain in a long time and was then able to remove it without apparent injury, the pyloric rest seemed to have so relieved the patients that they were able to apparently function all right and after this rest we were able on succeeding occasions to pass the tube through the pylorus with very little trouble.

One practical point as regards these cases: Most of these tubes are marked for the stomach, for the duodenum, etc. The more I work with these tubes and watch them the more I am inclined to conclude that there is a certain spot in every patient where you will get the bile the best, and as we keep a tube for each patient, when we reach that point we simply mark the tube and drain at the point where we believe drainage is most advantageous.

I can go Dr. Lucas one better: I have had a patient who tied the duodenal tube in a double knot every time I introduced it. I showed the

tube and a photograph of the patient with the tube in situ to Dr. Lyon and he said he had had similar experience. Radiologically we found this to be due to a hypermotility carrying the metal bulb rapidly around near the greater curvature and its falling as it approached the lesser curvature caused a loose knot which tightened when removed, the tube thus tying the knots. More knots could have been tied if there had been surplus tube. While I believed this phenomenon to be due to a hypermotility carrying the metal and the peculiar fact that when the tube enters the stomach it switches around toward the greater curvature, not following the lesser curvature as is generally the case, still I do not believe this would occur unless we were using the heavier metal bucket.

I am more than ever convinced of this: that in those patients who will not fatten, in whom it seems impossible to put on flesh, that much good can be done by rest in bed and feeding them through the duodenal tube. I think the next time I use the duodenal tube for this purpose I shall tie on the metal tip with catgut hoping that the catgut will be digested and the metal tip passed per colon thus leaving the tube in situ without any metal tip to it. In this manner the tube can remain in the tract indefinitely. There is quite a knack in feeding. I much prefer the apparatus designed by Einhorn for the feeding of these patients. Scrupulous cleanliness in this procedure is essential. In one case of hysterical vomiting we were able to very promptly relieve the vomiting by introducing the tube into the duodenum and allowing it to remain there for 72 hours or longer.

In many reports of the use of this tube it has developed that one disease that was practically without the range of successful therapeutics has been relieved and patients cured by its use. I refer to Renaud's disease. It has been shown that this disease can be relieved by the use of the duodenal tube kept in situ for days or weeks at a time and flushing the patient with large volumes of water, pint upon pint or quart upon quart of water in twenty-four hours. It has brought about restoration in a fair number of cases because fortunately the disease is somewhat rare. I have been trying to locate a patient who came under my observation about a year and a half ago, but have been unable to do so, as I wanted to try this method. Since I have been working along this line I have not been able to find a case of Renaud's disease in order to try the method in a practical way.

I would like to supplement one thing Dr. Lucas has said: He told us that he sometimes waited as long as six hours. I rarely quit under nine hours, sometimes twelve, sometimes twenty-four, and have succeeded in this way in draining seemingly resistant gall bladders.

I want to make one further suggestion: I have sometimes found that feeding bouillon by the mouth or bonillon and starch by tube will induce a flow of bile. I went on the plan that the physiological stimulation of protein in the stomach or protein and starch in the duodenum would bring about action of the hepatic structures and in this way open the duct if it was patulous or possible to be opened by that means.

These are simply a few of the many things that might be said on this important subject. I wish to say that I have watched quite a number of men, including Einhorn, Lyon, Bartle and others do this work. I do not consider it simple or easy. Reading the findings is very difficult and requires knowledge and experience. Case history taking and record keeping of these cases is so important that I have devised a record of my own to cover this particular line of work. I have submitted this blank to men working in this line and it has received the commendation of Lyon and others. Dr. Lucas has seen the record and I would like to have his comments on it. The idea of this record is to as far as possible secure uniformity in recording cases; that is to say, that the record will carry on its face the various possibilities that we find in gall bladder work and by simply checking these we can get a uniform record and reading of every available possibility in the study of these cases.

I wish to say that this method has a very wide field in my particular specialty. I think it offers a tremendous field of opportunity in diseases and disorders that have never been mentioned. It is of value in a good many cases of epilepsy so-called; or, I would more correctly say, in some of the epilepsies; it is of vast value in migraine and in other headaches, neural toxemias, and many other conditions.

The method opens a big field in so-called biliousness; it wipes off the map, if it still existed, the so-called gastric neurosis, because it enables us to get absolute and definite facts. It is an extremely valuable method in the ordinary headache that we are prone to class as due to toxemia. It is a field that broadens and broadens as one studies it until in my opinion it is going to become a very wide factor in the whole domain of internal medicine.

O. H. Kelsall: I have enjoyed Dr. Lucas' paper and Dr. Pope's discussion. It may be of interest to state that while in Philadelphia last summer I went to see some of Dr. Deaver's work, and noticed that he had a tube in the mouth of one of his patients and asked him what he was doing. He said he was merely conducting some experimental work for the benefit of his assistants. In this particular instance he was introducing some magnesium sulphate into the duodenum to see what effect it would have on the gall bladder which he intended to inspect while the abdomen was open. The patient was being op-

erated upon for pathology not connected with the biliary apparatus. Upon inspection after a few minutes the gall bladder was found empty. The tube had been introduced through the pylorus into the duodenum by Dr. Weaver working it through the pyloric opening with his hands, and it was shown that the gall bladder had thoroughly evacuated itself.

J. Garland Sherrill: Some years ago I stated before the Southern Surgical Association that before many years we would be doing more cholecystostomies and fewer cholecystectomies. Because cholecystectomy can be performed with little more mortality than cholecystostomy is in my opinion no reason that it should be done. I believe for cholecystectomy to be justifiable it is essential that you have actual indications for removal of the gall bladder; in other words, if there are so many cicatrices in the cystic duct that the gall bladder cannot functionate, or if the gall bladder is undergoing necrosis, or if it is malignant, then I believe you have positive indications for its removal; otherwise, I believe the gall bladder is of material benefit to the patient, not only to store bile but to relieve back pressure on the liver when the common duct is obstructed. I think the latter is one of the most important functions of this organ. Back pressure in the liver when the common duct is obstructed is frequently the cause of death from destruction of the functioning power of the liver. If we remove the gall bladder and eliminate from the patient this valve or this action which is a relief to the distension, we have limited his life by just so much. Now if we can demonstrate and prove, as seems to be possible, that by this method we can drain the gall bladder or drain the bile passages in the absence of the gall bladder, then there may be some justification for removal of the gall bladder, although I would prefer to have mine drained in the normal way if possible.

I believe this opens a wide field for study. The remarks made by Dr. Kelsall concerning Dr. Deaver's experimentation are certainly very interesting, and in that way we could prove or disprove the contentions of the medical men as to the actual facts in these cases.

What I would like to suggest is this, why not follow the line of reasoning stated by Dr. Pope not only to use different kinds of food but different drugs to determine the amount of stimulation on the gall bladder? The old question whether calomel was a bile producing agent or whether it caused stimulation of the biliary passages could be proved by putting calomel in the tube placed in the duodenum; the effect of castor oil and many other drugs could be tested in the same way. We could not only drain the gall bladder by introducing magnesium sulphate into the duodenum, but we could also drain the pancreas, an organ which we have never been able to at-

tack surgically with any degree of benefit to the patient.

I believe this is a step, while I was doubtful of its value when I first heard of it, which may be of great importance not only as a diagnostic measure before operation but of vast aid after operation, particularly operation for excision of the gall bladder; perhaps in many cases where the gall bladder is left it may be used as an aid to restoration of the normal condition of the bile passages by the removal of the bacterial flora present in the gall bladder assisted by drainage on the outside.

I do not see any reason in the world why drainage externally and drainage internally should not be practiced in some cases. This combined method of drainage is entitled to further study. I believe in this way we might get rid of much of the infection, and after all infection with stasis in the bile passages is the cause of conditions which give the patient so much trouble.

Fred L. Koontz: I regard the procedure described by Dr. Lucas as a very valuable addition to the armamentarium not only of the medical man but also of the surgeon. There is no question about the importance of the method, and I cannot help but emphasize the fact that the surgeon will welcome it for the reason that there is nothing in the whole range of surgery so confusing in diagnosis or that so worries the surgeon as the treatment of these vague and indefinite symptoms referable clinically to the gall bladder.

Heretofore all cases of acute cholecystitis, after the diagnosis has been made, have been referred to the surgeon who has operated and instituted drainage in the hope of relieving the symptoms. In doing this the patient has been carried through a severe if not a dangerous operation and in the end the surgeon has only accomplished drainage of the gall bladder and the ducts. Now, if it is true that by the method of draining through the duodenum the gall bladder, the ducts and even the liver can be drained quite as freely as could be done by cholecystostomy, something has been accomplished and a surgical operation has been obviated. I see no reason why surgeons should not welcome a procedure of this kind. The surgeon should be as much interested in the method as the practitioner of medicine.

Dr. Lucas in presenting his paper merely touched upon one point which is extremely interesting to the surgeon, and that is the differential diagnosis of conditions which heretofore have been left to the surgeon. In speaking of the presence of gall stones, either in the gall bladder or in the common duct, cholecystitis or obstruction of the common duct from inflammation, he simply gave infection as the cause and stated that he thought it was possible to make a

differential diagnosis both medically and surgically. I hope he will give us some further details in closing the discussion.

I believe that one of the most important features in connection with the procedure Dr. Lucas has described is that by its application we will in many instances be able to make a differential diagnosis between gall bladder and pancreatic disease. This is a subject about which the surgeon has heretofore been in the dark, i.e., we have been unable to determine where biliary disease ended and pancreatic trouble began, because we possessed no method by which a differential diagnosis could be made. Many times gall bladder pathology has been diagnosed where operation disclosed co-existing pancreatic disease which had not been suspected.

A point that occurred to me while listening to the paper and the discussion was that there may sometimes be difficulty in getting the tube through the pyloric orifice. If it is true that drugs introduced into the duodenum will relax and open the common duct and bile is permitted to flow from the duct because of this relaxation, why not introduce drugs into the stomach which will cause relaxation and facilitate passage of the tube through the pyloric opening? The use of belladonna and atropine should prove satisfactory for this purpose.

If Dr. Lucas can enlighten us further along this line in closing I would like for him to do so.

M. Casper: Dr. Lucas is to be commended on the excellence of the paper he has presented, it is one of the best we have heard for a long time. I believe the method of procedure he has described will prove a great boon to surgery. Some of the members probably came here tonight expecting there would be a controversy between internists and surgeons, but on the contrary I am glad to see everyone has complimented Dr. Lucas on his paper.

Regardless of what may be accomplished in the future in a therapeutic way by this plan of procedure, at the present time the method deserves greatest consideration from a diagnostic standpoint. Not infrequently a patient with gall bladder pathology will come to us at a time when the case is inoperable, and therefore our hands are tied. I saw such a patient today, a man in middle life who evidently has focal infection located in his gall bladder, he has Bright's disease, disturbed cardiac function, a high blood pressure, etc., all of which causes one to hesitate about advising operation. In such cases as this I can see great possibilities of benefit to the patient by the procedure described, and I shall certainly recommend it to him.

Another class in which the procedure will be of great assistance is early cases of gall bladder disease. It will help the surgeon in such

cases for several reasons; first, the patient will be induced to consult the general practitioner earlier, and by this method the cause of the trouble can be promptly recognized; second, it will have a tendency to discourage self-medication. We know that many of these patients treat themselves by taking various kinds of digestive preparations, pepsin, etc., for so-called "indigestion" before consulting a physician, and in the meantime the pathology becomes progressively more serious. Sometimes the patient allows himself to get into a dangerous state before he even seeks medical attention; but I am sorry to say that the general practitioner is often too lax in his examination and treatment of early cases. I believe much benefit will be derived by following the plan Dr. Lucas has described, and in that way it will be a great help to the surgeon in early recognition and differentiation of gall bladder pathology.

I do not understand that Dr. Lucas expects to accomplish impossible things by the mechanical means outline, for instance I take it he is not going to try and remove large gall stones. When biliary concretions have attained any considerable size I have great doubt whether they can be removed by this method. Every surgeon has had the experience of trying to force gall stones through the ampulla of Vater by means of the fingers with the hand in the abdominal cavity; it is even difficult by the "milking process" to move a gall stone backward or forward in the common duct; so I have great doubt about the possibility of removing any gall stones by this method; but bacteria, infective material and even inspissated pus can probably be thus removed in many cases.

I wish Dr. Lucas would tell us in closing whether he has tried phosphate of soda, phthalein, calomel and other so-called cholagogues in the place of magnesium sulphate, and if so with what results.

I believe the essayist has opened a great field for future investigation, and the society is greatly indebted to him for his splendid paper.

Curran Pope: I have found that instead of using in the apparatus shown by Dr. Lucas the weak bulb, tubing and clamp, that there is a distinct advantage in simply employing a heavier bulb. I have used a white bulb about $3\frac{1}{2}$ inches long and very heavy, and have had placed on it a reverse valve; that is to say, a reverse valve on the distal end, and all you have to do is to hand this to the patient who squeezes the bulb which keeps the suction constant without the need of a tube and clamp on the distal end of the bulb. This has proved quite a help and the patient is interested in keeping the suction going. With the weaker bulbs, unless carefully watched, obstruction of the tube is likely to occur if the bile or contents removed are at all thick or viscid.

Chas. G. Lucas, closing: I was quite well aware in preparing my paper that a great many points would be raised in the discussion because of the fact that a new procedure was being described. I will try to answer some of the questions.

Like Dr. Pope I have noticed that in the passage of the tube there is one spot at which bile is best obtained, and this varies with each patient. As a matter of fact the marks on the duodenal tube are much too far apart.

About tube sterilization: The tubes are kept in a lysol solution two per cent over night, and are then re-sterilized in the morning before being used.

If I had known Dr. Pope expected to report that a "double knot" had occurred in some of his tubes, I would certainly have put "three knots" in mine.

I like the suggestion of Dr. Pope about duodenal feeding. Kaplan has for some time been treating duodenal ulcers by introducing medication through the tube passed into the duodenum, and the patient is also fed in this way. I have left one of the Lyon tubes in situ for a week and fed the patient through this tube. I had an experience two or three years ago where I fed a young girl for three weeks in that way. I did not like the Eihorn apparatus and in that case used a modified thermos bottle as suggested by William Gerry Morgan of Washington. On another occasion I introduced the duodenal tube and fed a girl who had hysterical vomiting for two weeks. She was perfectly relieved.

If the patient is in the hospital and I fail to introduce the tube, then I would get the patient to swallow a few yards of thread the night before and the following morning the tube could be slipped through into the duodenum within twenty minutes at the most. Brown, who has had a great deal of experience, says if the patient is given a rest and then another attempt is made, the tube can usually be introduced. However, he remarks that in some of his cases it has been necessary to force the tube through the pyloric orifice by the aid of the fluoroscope. In all the cases I have seen I have succeeded by having the patient walk around for a few minutes, then giving them a cup of bouillon or a glass of water.

In my opinion the record proposed by Dr. Pope in this class of cases is the best that I have seen. I look at it every day now and wonder how I can find time to keep up with it. The scheme is all right in hospital work but in office practice it is going to be a hard job. I also agree with Dr. Pope that this is a wonderful field for investigation and wish I had the opportunity of telling you all of the things that have been accomplished by Dr. Lyon and others.

The suggestion made by Dr. Sherrill of using calomel is a good one. Phosphate of soda,

bicarbonate of soda, phenolsulphonephthalein and other drugs might cause relaxation of the papilla of Vater and might also have some action on the pancreas. I believe we are just beginning to realize what can be done by the method I have described.

It is not the expectation of Lyon, who is the most enthusiastic man on this subject I have ever seen, that this method shall be confined to any certain class of physicians. The observation of a few cases, of course, is not a safe criterion, but when we have seen many thousands we will have a better idea of just what can be done.

I was particularly glad to hear what Dr. Koontz had to say. It may be interesting to state how I first came to use this method. I had under observation a young girl with chronic cholecystitis in whom I was particularly interested and tried very hard to be of some service to her. At the end of five months I suggested that nothing more could be done in a medical way and she ought to see a surgeon. She refused to listen to anything which meant a surgical operation. She was told to return in a week and I would see if there was anything further to be done, and more with the idea of doing something than anything else I introduced a duodenal tube with a Reed tip. This was passed into the duodenum and the patient turned on her side as you see in the case before you. In this way a tremendous lot of material escaped through the drainage tube. I did not know just how much good was going to be done, but she returned in a week and said she felt much better, so I repeated the performance. I saw Dr. Lyon a few weeks later and told him about this case, and he asked if I had introduced sulphate of magnesia through the drainage tube and I told him I had not. He said he thought it might do some good. After my visit to Philadelphia I came home and telephoned this patient to return for further treatment. To make a long story short, I drained that girl five different times and she now says she is perfectly well, that all her symptoms have disappeared, and she is having no further trouble.

This first case in which this method was used is most interesting. The patient (a young girl) first had a cholecystostomy, then cholecystectomy; then she returned and they found some stones in the common duct. After she had been admitted to the surgical side of the hospital nine different times and operated upon for adhesions, etc., they finally "threw up their hands" and turned her over to Dr. Lyon for further observation. When I saw that girl and read the history of her numerous surgical operations with the bacteriological and cytological findings, and noted the apparently perfect recovery under the treatment of Lyon, I could not help being impressed with the fact that it must be a wonderful thing.

I did not touch on the differential diagnosis between cholecystitis, cholelithiasis, etc, because my time was limited, but there is much to be said on the subject. If you will read Lyon's original work along this line much useful information will be found.

The duodenal tube is of value not only as a diagnostic measure but as a means of therapeutic application. The patient before you was thought to have chronic cholecystitis; this is the second time he has been drained after the introduction of sulphate of magnesia; the third treatment may be necessary before complete relief is obtained. Lyon stated that sometimes it was necessary to introduce the tube at least three times before the inspissated mucus could be dislodged and washed from the bile passages. He has introduced a weak solution of silver nitrate or some other cleansing agent in some cases before using sulphate of magnesia.

It is a method of treatment which requires a great deal of time and patience, but the results secured thus far have amply justified the procedure. Lyon has shown that permanganate of potassium and certain other drugs will cause relaxation of the sphincter of Oddi, but they have proven less satisfactory for this purpose than sulphate of magnesia. The action of every drug is being watched by careful observers and experiments are being constantly made. It has been shown that magnesium sulphate introduced into the stomach did not have the same effect in relaxing the sphincter of the duct as when injected directly into the duodenum.

I agree with what Dr. Casper has said: I am aware that patients not infrequently return to the surgeon for secondary operation, and especially is this true in gall bladder pathology. I do not mean to say that all such patients return, but many of them do, complaining of symptoms more serious than before the original operation. Every patient should be carefully studied, the blood and urine should be examined, blood pressure recorded, etc. In addition, in gall bladder cases, the drainage method I have described with bacteriological examination of the drainage material, will give the surgeon much valuable information and enable him to better care for the patient in the event operation becomes necessary.

I have been greatly impressed with the importance of this subject and am going to read a paper later on the same subject dealing with patients whose appendices have been removed and where their gall bladders were afterward drained by the method you have seen demonstrated. I have quite a number of cases where both the appendix and gall bladder have been removed, and have been able to accomplish some good in every one of them. In some instances the appendix has been removed and the gall bladder drained, the sur-

geon evidently deciding that the pathology present did not justify cholecystectomy.

I have been able to afford a great deal of comfort to a personal friend whose appendix was removed. When I first saw him a year ago I made the diagnosis of chronic appendicitis and probably some gall bladder pathology. At the operation, however, the surgeon decided that the gall bladder was normal and it was not disturbed. Within six weeks after the operation the patient required hypodermics of morphine three or four times a week for relief of pain. He was first drained the latter part of September, 1920, the procedure was repeated in two weeks, and again four weeks later. He was completely relieved of pain and morphine is no longer required.

It is quite true that it may be difficult to push a gall stone through either the cystic or common duct, as Dr. Casper has said; but he failed to take into consideration one thing, i.e., that under the influence of magnesium sulphate the ducts are relaxed, and especially is this true of the ampulla of Vater. It is not to be expected that large gall stones will be exuded by this method of treatment, that is not the idea; **but it has been shown that small gall stones have passed with the bile during drainage; several gall stones have also been recovered from the stools by passing the feces through a sieve after one of these treatments.** It would seem, therefore, that magnesium sulphate does cause relaxation of the ducts.

I have had practically no trouble in introducing the duodenal tube. As a rule when the patient takes a long breath, with his head in a backward position, the tube is introduced without nausea or vomiting; the chin is then brought forward and the tube passed without difficulty.

I would like to say a few more words about gall stones: The wife of a friend of mine (a professional man well known to all of you) the mother of three children, undoubtedly had gall stones and her husband had found it necessary to give her morphine for relief of pain on several occasions. She declined flatly to consider the idea of an operation. When I suggested the duodenal tube be passed she was told that it was not considered as the proper treatment for gall stones, that surgery was indicated in her case; but she insisted upon my trying the tube anyway. With a great deal of difficulty a small tube was passed the first time, but the second and third times she seemed to have very little trouble. The tube was used at intervals of two weeks. The first time we were able to obtain very little bile, the drainage consisted of dark tarry-looking material. At the fourth tubing a large quantity of bile was obtained showing the different colors as I have described. I had a letter from her last week say-

ing the roads had been so bad she could not return for another treatment as she had expected, but was "feeling fine."

In another similar case the patient has also been drained four different times. The fourth time two months ago the bile was perfectly orange in color. The man feels well and weighs 162 pounds; when I first saw him in July, 1920, he weighed about 136.

I am now working on a number of cases of so-called biliousness and chronic constipation. In one of my cases particularly, where the patient has been treated by only one insertion of the duodenal tube, I was impressed by two things which occurred: The patient is a woman about 32 years of age, and has a daughter aged 12. She said that from the birth of this child she had been compelled to take a laxative every night. Following the first tubing her alvine evacuations had been regular. About four weeks later her husband telephoned to make an engagement for a second introduction of the tube, because he said the first treatment "had made her disposition so much better."

I think this is the greatest field for investigation that has been opened in many years, and we are just beginning to realize the possibilities of the method.

Carbon Monoxid Asphyxia.—It is shown by Henderson and Haggard that during the development of carbon monoxid asphyxia there is a vigorous hyperpnea, and that thereafter, probably owing to deficient oxygenation and other causes, there is a diminished production of carbon dioxide. As a result deficiency of carbon dioxide in the blood, asphyxiated animals when restored to pure air exhibit for half an hour or more a very marked depression of breathing. The rate elimination of carbon monoxid is correspondingly slow. The condition of tissue asphyxia is thus continued, although the body is surrounded by fresh air. It is suggested that this postgassing period of continued asphyxia may be of critical importance in inducing subsequent structural degenerations and functional impairments. Its abbreviation is therefore an important object both for therapy and prophylaxis. Oxygen inhalation during this period has only a slight effect; it is not adequately inspired. Inhalation of carbon dioxide diluted with air has an immediate effect. It augments breathing and thus hastens the elimination of carbon monoxid. Inhalation of oxygen plus carbon dioxide is far more effective than either gas alone; for the augmented breathing allows the oxygen to effect a rapid displacement of carbon monoxid from the blood. Functional restoration is correspondingly accelerated.

THE TREATMENT OF ECLAMPSIA*

By EDWARD SPEIDEL, Louisville.

The subject of eclampsia should always merit attention, because it presents phases that are of interest not only to the obstetrician but to the internist, the oculist and of late even to the general surgeon. The treatment of the albuminuria and high blood pressure premonitory and associated with this condition should surely engage the earnest attention of the internist. The discovery of a retinitis albuminuria by the eye specialist is a very important diagnostic feature determining the further conduct of a pre-eclamptic toxemia, while the surgeon who expects to deliver these cases by Cæsarean section should be well informed upon the indications and limitations of that occasionally valuable means of treatment.

In spite of intensive research work little progress has been made toward a proper solution of the cause of eclampsia. Investigations by Dienst seem to indicate that the blood in eclampsia contains an abnormally large proportion of fibrin ferment. In normal pregnant women, fibrin ferment can be found in the amniotic fluid surrounding the fetus as early as the second month, but in these normal pregnant women no free preformed fibrin ferment is ever found in the blood plasma. Accordingly, he reasons that the maternal placenta is the source of production of this fibrin ferment. This excess of fibrin ferment produces a spasm of the blood vessels with resulting edema and increased blood pressure finally culminating in eclampsia.

Bory claims that the placenta is an organ of metabolism like the liver and that eclampsia is the result of insufficiency of its action if it permits the toxins of the fetus to pass into the maternal circulation unmodified.

Whatever may be the predisposing cause, the exciting factor in the final onset of eclampsia no doubt is often an intestinal toxemia and it may readily be claimed that the condition is similar to an anaphylaxis in that the maternal organs functioning to their limit to discharge the toxic products of both mother and fetus become inefficient when an added factor in the form of an indigestible food product is added to this burden. Under such circumstances neither the toxic food products or the ordinary toxins from the mother and fetus are eliminated and eclampsia results. The history in a number of cases of indulgence in ice cream and cabbage, sour kraut and beer, lobster, etc., the day before the on-

set of the eclampsia would surely seem to indicate some association with the condition.

As to a treatment for this condition, the comparatively few cases that even the trained obstetrician sees make it impossible to determine a definite course to pursue in each case. The only thing left then is to be guided by the experience of men in the large maternities, where definite treatments have been carried out on a sufficiently large number of patients to show results. True as the old hackneyed expression has it "every case is a law unto itself," but in a condition that occurs as infrequently as eclampsia the inexperienced man must have some definite course to pursue and then as his experience ripens he may institute additional procedures as his judgment will dictate.

The ordinary treatment of the pre-eclamptic state with its edema, albuminuria and increased blood pressure, should be familiar to all. Additional measures, however, may be suggested in those cases not promptly responding to these ordinary means. Increased blood pressure may under such circumstances be reduced before the onset of eclampsia by small repeated venesections of about 100 c.c. until a desired result is attained. Intravenous introduction of four per cent glucose solution should favor diuresis and this again may be aided at the time by keeping the patient on a more or less salt free diet. Lemonade should be given to these patients freely.

In the treatment of eclampsia itself, that outlined and reported by McPherson of the Lying-in Hospital of New York, presents the best statistics and is now endorsed by the leading obstetricians of this country. He reports a maternal mortality of nine per cent in fifty-five cases of eclampsia treated by the following conservative method:

"Immediately on entrance to the hospital the patient's blood pressure is taken, a catheterized specimen of urine is secured and she is put into an isolation room which is darkened and as much quiet as possible obtained. She is then given one-half grain of morphine hypodermically, stomach lavage is practiced and two ounces of castor oil are poured down the tube at the end of the lavage. She is then given a colonic irrigation of five gallons of five-per-cent glucose solution. If the blood pressure is above 175 then, venesection is performed to bring it down to 150. Normal saline is not injected. One-fourth grain of morphine is then injected every hour until the respirations drop to eight per minute. Convulsions by this time have generally ceased, the patient will be in labor, and will be delivered normally or with an easy low forceps operation."

The especial advantage of this method prac-

*Read before the Jefferson County Medical Society.

ticed by McPherson, which is a slight modification of Stroganoff's advocated a number of years ago, is that it can readily be practiced by the general practitioner, who originally sees most cases of eclampsia. If the eclamptic is not near full term the convulsions should subside under this treatment and delivery occur spontaneously one or two weeks later. In most cases of eclampsia at or near full term, the convulsions initiate labor, start a dilatation of the cervix and generally prepare everything for an early delivery. This is especially true in multiparae in whom the majority of eclampsias occur. If this treatment is followed in a primipara at term and delivery is not started, then it should be wise to initiate it by the introduction of a Vorhees bag through the cervix and to complete the delivery either by forceps or version when the bag is expelled. The patient by that time is so deeply narcotized by the morphine, that the few manipulations necessary will not disturb her and delivery can be accomplished without an anesthetic. In cases that show decided cerebral symptoms lumbar puncture with the withdrawal of one ounce of spinal fluid may at times be beneficial.

McPherson, in his series of fifty-five cases, made one peculiar observation. His fetal mortality was nineteen per cent, mostly premature and macerated children. In no case which was at term and in which a fetal heart sound could be heard did the large amount of morphine used affect the viability of the child.

Another peculiar observation is that contrary to what would be expected there is a marked increase in the discharge of urine, showing that the morphine relaxes the vasomotor spasm caused by the pregnancy toxemia and so brings about increased kidney excretion.

Cæsarean section is advocated for this condition and it may be beneficial if there is a special indication for it. In such a case the narcotics as advocated in the McPherson treatment may be administered and little or no additional anesthesia will be needed during the operation.

The venesection should be omitted because the amount of blood lost in the course of the operation will ordinarily be equivalent to the quantity that would be withdrawn by venesection. If the patient is edematous then added precautions should be taken in closing the abdominal incision, supplementary silk-worm sutures being needed to re-enforce the catgut ordinarily used. One writer reports two such Cæsareans in which the abdominal incision gaped wide open at the end of a

week in consequence of neglect of this precaution.

A Cæsarean operation should rarely be justifiable if the fetus is not viable for at that early period prophylactic measures and the narcotic treatment should control the convulsions and give time for elimination and the possible continuation of the pregnancy.

When the eclamptic patient is at or near full term then the convulsions themselves institute or expedite delivery and in many instances the patient expels the fetus without assistance. If not, then after the patient is in deep narcosis under the McPherson treatment manual dilatation, version or a forceps operation can readily be resorted to in order to deliver the patient with but little disturbance.

In primipara with an undilated cervix or with a posterior position of the occiput if the patient is not showing definite indications of improvement under the narcotic treatment, then a Cæsarean section may quickly and satisfactorily deliver the patient. At present the actual value of Cæsarean section in this condition is not established because no definite statistics are available as to the mortality under this treatment. If all operators will publish their results, successful or not, then some definite idea of the status of Cæsarean section in this condition may be gained. The percentage mortality of published cases of Cæsarean section in eclampsia at present is twenty-five per cent, a much higher death rate than be secured by this conservative treatment.

The advocates of immediate delivery in eclampsia justify the procedure by claiming that as the fetus is the source of the toxins, that the eclamptic attack should subside upon its removal. That such is not the case is established by the many cases in which the convulsions continue after the removal of the fetus and especially those cases of post-partem eclampsia in which convulsions do not begin until several days after delivery. It must be remembered, therefore, that although you possibly remove the source of the toxins with the delivery of the fetus, that you do not thereby influence the toxins in the circulation and those stored in the tissues and these are the ones that bring about a continuation of the convulsions after delivery or institute eclampsia post-partem.

The narcotic treatment should be used in such post-partem cases just as directed with the possible exception of the venesection. In most instances the natural blood loss in the course of the delivery and the lochial discharge post-partem will have resulted in such a reduction of blood pressure that venesection will not be necessary.

CAESAREAN SECTION; INDICATIONS; REPORT OF CASES*

By J. HUNTER PEAK, Louisville.

The origin of hysterotomy for the delivery of fetuses in women who could not be normally delivered is so ancient that it belongs to mythology. Accidents to women approaching the end of gestation in which the abdomen and uterus have been "ripped," as by a bull, are well known to history and fiction. The birth of MacDuff in Shakespeare's *Macbeth* is such an accident. You will remember the witches had told Macbeth "to fear no man born of woman," but they added "to beware of Macduff." When Macbeth told Macduff that he bore a charmed existence, and no man born of woman could take his life, Macduff remarked that "he was not born of woman, but was from his mother's womb untimely ripped by an infuriated bull." There are recorded many authentic instances where the uterus was opened just at death of the mother for the purpose of saving the unborn child. This has happened when the mother perished from eclampsia and other diseases and also in accidental deaths.

The word "Cæsarean" is probably from the Latin *cādere* (i.e., to cut) but most writers seem to think the operation of hysterotomy derived its name from Cæsar, since it is known that Julius Cæsar was brought into the world by that method, his mother agreeing to sacrifice her own life in order to have an heir to the throne. During the dark ages Pampillia made it obligatory upon physicians to remove the child after the death of the mother for the purpose of baptism with the intention of giving force to the decretals of the Roman Church.

During the sixteenth century Francis Roussett published the histories of fourteen successful Cæsarean sections, six of which were performed upon the same woman. These reports were questioned then by his opponents and are now regarded as unauthentic. The first operations following Roussett's report were fatal. The first authentic reports of successful cases came from Germany, the operations being performed by Trautmann, of Whittenberg, in 1610. Until recent years the operation was considered to be exceedingly hazardous.

Michaelis, in 1833, collected 258 authentic cases of which fifty-four per cent ended in recoveries. To these Kayser added 86 cases reported by Roussett which reduced the percentage of recoveries to thirty-eight per cent.

Mayer, in 1868, tabulated 1605 cases with fifty-four per cent of recoveries. Harris, in 1888, collected 153 cases in the United States of which forty-six were successful, making about thirty-seven per cent recoveries in this country. Thus it will be seen that prior to 1888 nearly fifty per cent ended fatally.

Spaeth, writing before the operation originated by Sanger had checked the fatal results, stated during that century in the Lying-In Hospital in Vienna only four of the mothers survived. In 1873 Baudon said in Paris there had not been one successful operation in eighty years, though fifty women had been thus operated upon. Septic infection and postponement of the operation until death was imminent was responsible for the mortality.

What was possible, after eliminating the dangers of barbaric methods of surgery, was shown in the report by Harris, in 1887, giving the histories of nine women whose wombs had been ripped by infuriated cattle with the recovery of four of the mothers and six of the children. Again, in six self-inflicted Cæsarean sections five of the women recovered.

Of hardly less importance was the idea extant that on account of the alternating contraction and relaxation of the uterus it could not be sutured, consequently the uterine wound was left open for the invitation of all sorts of troubles. Infections happened many times, weakened abdominal walls obtained, hernias followed, also in future pregnancies uterine ruptures were many.

Then Porro came and to avoid the dangers of the open operation he advised and practiced the so-called ovario-salpingo-hysterectomy. And while he lowered materially the mortality, he sterilized the woman, induced the menopause with all its attendant evils, and the procedure was contrary to the teachings and beliefs of the Roman Church.

Sanger then demonstrated the old idea to be fallacious that the uterus could not be sutured, and by using uterine sutures accomplished the same results Porro had obtained without the attending mutilation and its dangers. Sanger's ideas were verified by such men as Polni, Beckett, Jenks and others. This put the Sanger operation on a sound surgical basis.

Then followed the later methods of acquiring full knowledge of the pregnant woman, and by early operation before she was exhausted, mutilated or infected by repeated examinations and instrumentations, modern surgery has made the procedure no more dangerous than any other abdominal operation.

It might here be stated that while Sanger

*Read before the Jefferson County Medical Society.

is justly regarded as the father of modern Cæsarean section, Harris and others in this country had insisted upon the principles advocated by Sanger being followed. While many of the professional brothers were spending their time declaring that "Cæsarean section profited nothing," Sanger's work awakened anew the interest in this operation as modified by modern surgical principles, and it soon met with a ready response and the triumphant re-establishing of the procedure in the domain of legitimate surgery; and the croakings of the anti-Cæsarean school are no longer heard.

Indications: Nagele's pelvis, or pelvic contractions of whatever kind, and there are many. Vaginal cicatrization, or obstruction of any kind which cannot be removed. Advanced carcinoma of the cervix which will prevent dilatation and cause tears with fatal hemorrhage if the woman is delivered normally. Crossed or shoulder presentation, especially where the arm is protruding. Placenta previa. The duty of the physician is to do the best he can for his patients, both mother and child; he cannot constitute himself a judge nor an executioner, but must work in the best interests of both. Eclampsia, when it occurs after the seventh month, and by the Cæsarean operation both mother and child can be saved. Eclampsia rarely ever supervenes before the seventh month. Large ovarian tumors which push the child so out of position with reference to the parturient canal that normal delivery is impossible. Uterine fibromata so situated that labor cannot be terminated normally. Occipito-posterior position, where high forceps operation would be necessary, especially where labor has already exhausted the mother and complete uterine inertia has supervened. And it goes without comment that if the child is alive, in case of the mother's death from disease or by accident after viability, the uterus should be incised with the view of saving the child.

The Porro operation is never indicated in my opinion, but a modified Porro may be performed in all cases: (a) where future pregnancies are to be avoided, (b) where some intervening condition, such as eclampsia, occurs before labor has started and there is no dilatation of the cervix. Such a condition might produce death from hemorrhage concealed in the uterus which could not be emptied in the normal way on account of the cervix not being dilated.

What I mean by a modified Porro is simply a supra-vaginal amputation which can be done easily and quickly by clamping the broad ligaments in two places on either side of the uterus downward to the utero-cystic

fold; cutting between clamps and amputating the uterus at this fold; ligating the ligaments on either side; removing the clamps and turning the broad ligament pedicles together over the uterine stump; then suturing the uterine stump flaps over the pedicles; thereby maintaining the pelvic floor, completely covering all raw surfaces, and eliminating every possibility of hemorrhage.

The operation of Cæsarean section is done by surgically preparing the patient just as for any other abdominal section. Unfortunately this cannot always be accomplished because many of these patients come to the surgeon after repeated examinations and unsuccessful instrumentations; but even then the surgeon should do the best he can in their pre-operative preparation.

The surgeon should have present an obstetrician and two assistants. The obstetrician's duties are simply in the interest of the baby at the operation and all obstetrical care of the mother and baby afterward. He stands to the surgeon's left, the surgeon being on the right side of the patient. The first assistant faces the surgeon on the patient's left, and the second assistant stands to the first assistant's right. The duty of the first assistant is to control hemorrhage by pressure with both hands around the uterus and the broad ligaments. The duty of the second assistant is to help the surgeon by keeping blood wiped away while the operation is in progress, or at least until the baby is delivered and the uterus is sutured. If the assistants are unfamiliar with the surgeon's mode of procedure, they should be made acquainted with their several duties before the work is started, because thereby speed can be attained; and this is one operation which should be completed as rapidly as possible—at least until the baby is safe in the hands of the obstetrician and hemorrhage is under control.

The incision is made through the abdominal wall two-thirds of its length above and one-third below the umbilicus. I do not like the Davis method of incising the abdomen and fundus, because it does not afford the surgeon sufficient room to work rapidly. The abdominal wall of pregnant women is not nearly so thick as one might suppose even in the most corpulent, and the uterus so far as I know is always in contact with the abdominal wall.

The next step is to pack a five-yard piece of gauze well around the uterus, beginning at the lower angle of the wound on the left and continuing well underneath to the same point on the right, completely isolating the uterus and keeping other abdominal viscera

out of the way and well protected, thus insuring a nearly perfect peritoneal toilet.

The uterine incision is made across the fundus and downward in the median line in front long enough to permit delivery of the baby. All this should be done as quickly as possible with little heed as to hemorrhage except pressure by the first assistant as already mentioned.

Sometimes the placenta is attached to the anterior uterine wall or to the fundus. In such cases after dividing all the uterine tissue the hand is forced through the placenta and the first foot felt is grasped and the baby thus delivered. If only the membranes are in the way they may be divided with scissors.

Almost invariably the uterus contracts and the placenta is extruded through the wound, but if not it may be easily removed with the membranes. Be sure the uterus contracts before the sutures are applied. If the section is undertaken before dilatation has occurred, the cervix may be easily dilated with the fingers except in primiparæ operated upon before the beginning of labor or in multipara where there is much cervical scar tissue. If dilatation cannot be accomplished a modified Porro operation can be performed without danger.

The uterine sutures should consist of number one ten-day chromic catgut introduced in interrupted or uninterrupted fashion through the musculature but not perforating either the serous or mucous coat, then with the same kind of suture the serous or peritoneal coat is closed by the Czerny-Lembert method.

There are few cases—and I have never seen one—where the incision does not divide one or more of the so-called uterine sinuses, which are simply pools of venous blood. These cannot be controlled safely except by mattress sutures so placed as to include both sides of the sinus, then one end of the suture beyond the knot is passed through the mattress loop on the other side of the uterine incision and tied to the other end of the mattress suture. This not only controls sinus hemorrhage but approximates the uterine wall.

The gauze used in making the peritoneal toilet is then removed and the abdomen cleaned of all clots—but seldom should there be any. The abdominal wall is closed in the usual way by the tier method of suture and the wound toilet completed the same as in any other abdominal section.

I have performed nineteen Cæsarean sections, and have seen but two patients who did not afterward develop alarming tympany, no matter what the previous conditions may have been as to preparation, nor whether the cases were selected or not, and I have used every

thing to prevent it; but as soon as free alvine evacuation was secured by the administration of oleum ricini oz. ii and oleum tiglitgts. ii, mixed and given on the third day, it was found that recurring gaseous distension could be prevented by the use of ten to fifteen drops of pituitrin given hypodermically every three or four hours for two or three days. Therefore, in the last two cases I have given the first dose of pituitrin just before the operation, repeating it every three or four hours for two days, then on the third day giving oleum ricini oz. i, and in both of these cases there was not the least distension at any time.

I never apply the outside dressing tightly in any of my abdominal work, but would do so in these cases if it were not for the fact that custom has made it almost imperative on the part of attendants to place around the patient the so-called abdominal binder; and this I permit the nurse to do when the patient is returned to bed.

It is not my intention to burden this paper with detailed report of the entire nineteen cases in which I have operated, but will briefly outline a few of them to illustrate some of the conditions in which I have found it necessary to effect delivery by Cæsarean section. Included in the nineteen cases there were:

Three uterine fibroids, one with crossed presentation:

Two Nagele's pelvis:

Two eclamptic cases:

One vaginal cicatrization:

Four contracted pelves:

One cretin deformity:

One carcinoma of cervix; the patient recovered and lived eight months, then died from cancer of the uterus:

Two placenta previa:

One crossed presentation with elbow and cord through the placenta; no pulsation in the cord; mother had exophthalmic goiter; that state of labor had existed for six hours and the patient had bled almost to exsanguination before I was called; the Cæsarean operation was considered quickest and safest method for mother; child already dead. This mother and child are the only ones I have ever lost.

One crossed presentation with elbow through cervix:

One occipito-posterior position; slightly contracted pelvis, large child; uterine inertia persisting ten hours.

Case 1. Mrs. W. C., aged 32, thirteen months previously, notwithstanding the presence of a reasonably large uterine fibroma, gave birth to a fine boy. The presentation

was breech and delivery was rapidly completed by Dr. Edward Speidel to save the life of the child. The perineum was badly torn and primary perineorrhaphy which I did was not entirely successful, there remaining a small recto-vaginal fistula. It might be well to state that the patient was in the hospital with the expectation that a Cesarean operation would become necessary on account of the fibroid tumor. However, Dr. Speidel was called as the obstetrician and delivered her through the normal channel as already stated.

Within four months this woman again became pregnant and in due course of time came to the hospital for delivery. Labor pains were feeble and there was no progress for three or four days. It was then decided to perform Cesarean section and remove the tumor at the same time, which was done the latter part of January, 1920. Dr. H. A. Davidson was the obstetrician on this occasion and very skillfully cared for the baby and the obstetrical features of the mother.

The specimen which I exhibit consists of the fibroid tumor and the uterus removed by supra-vaginal amputation. The existing recto-vaginal fistula was repaired two months later. The patient is now perfectly well and has a fine baby than whom none could be more handsome.

Case 2. Mrs. G., aged 22, primipara, was about seven months advanced in utero-gestation when she became ill, which was at least one month before I saw her. She was under the care of Dr. J. H. Hicks, who was also the obstetrician. For some unknown reason the patient did not observe all of his instructions and became more seriously ill with symptoms of eclampsia during the eighth month. I was then asked by Dr. Hicks to see the patient, and found she was so markedly swollen that her eyes were nearly closed; she was almost blind; considerable muscular rigidity was present. The entire body was swollen, and the lower limbs and vulva were so edematous that a vaginal examination could not be made. The only position the patient could assume was on her back with the legs far apart and flexed at the body.

Cesarean section was performed immediately. The swelling rapidly subsided, the intestinal and renal functions became regularly active, and she was nearly well when empyema developed demanding rib resection for drainage. The patient finally recovered and she and her baby are now in good physical condition.

In this case there was no dilatation of the cervix; the patient was a primipara in the eighth month of gestation; a modified Porro operation was done for the purpose of pre-

venting subsequent troublesome hemorrhage and other sequelae.

Case 3. Mrs. K., aged 22, about eighteen months prior to the present pregnancy was delivered by forceps of a seventeen-pound baby and was badly lacerated. Not only was the perineal body divided but the rectum was torn from below upward for nearly three inches. Primary repair was entirely successful, but the patient was informed that on account of the extensive vaginal cicatrization should another pregnancy occur she had better be delivered by Cesarean section.

In due time she again became pregnant and I was consulted. She was carefully watched and given every necessary attention until time for delivery. After labor was well started at the hospital she was taken to the operating room and Cesarean section was performed. A modified Porro was done at her request for the purpose of preventing future pregnancy.

The question might be asked, "why not ligate the Fallopian tubes to prevent further pregnancies?" This may be answered by stating that it has sometimes been observed chronic endometritis and other disagreeable uterine conditions arise which harass the patient until hysterectomy has to be performed. Moreover, I do not believe it makes much difference to the woman; in fact, if she is to remain barren, it is thought by many safer to do the modified Porro. The moral question also arises, "should a woman be made barren even though she could not bear children normally?" This is one, however, which I believe the woman herself should decide. Dr. A. W. Nickell was the obstetrician in this case.

Case 4. Mrs. B., aged 24, primipara, had been in labor fifteen hours, under the care of Dr. George White. Labor pains then ceased and complete uterine inertia supervened. The cervix was fully dilated early in labor and both quinine and pituitrin had been administered with no results. I was called to see the patient about midnight and thought possibly if she was given a rest her labor pains might again become active. It should be stated that the bag of waters had ruptured spontaneously during the time the pains were active. There was no descent of the head into the true pelvis, in fact it was so high that the presentation could not with certainty be determined; but both the family physician and myself were of the opinion that there was an occipito-posterior position.

The patient was taken to the hospital and placed in bed. She immediately went to sleep and slept until awakened at eight o'clock the following morning. Another examination was

then made; there had been no change in the position of the fetus, and there was still complete uterine inertia. It then became a question of high forceps delivery or Cæsarean section. After the dangers and possibilities of each had been fully explained, the patient chose Cæsarean section. Preparations were accordingly made and the operation performed about ten o'clock the same morning. Aside from the fact that it was difficult to get the baby to breathe there was nothing alarming about the case. The position was what we had suspected; the baby's head was very large; the antero-posterior pelvic diameter was much less than normal for so large a woman. Exact measurements were not made for obvious reasons. The uterus was flabby and did not contract until the placenta and membranes had been mechanically removed. Contractions then occurred and the operation was completed in the usual way.

It might be stated that this was one of the two cases previously mentioned in which the administration of pituitrin was started before the operation and repeated every three or four hours, the idea being more to keep the uterus contracted than to prevent subsequent tympany; but from the fact that in this instance no distension occurred, pituitrin was administered to the last patient operated upon and she also had no tympany. I am of the opinion, therefore, that if pituitrin is given the chances are tympany will not occur—or at least not nearly so frequently.

Case 5. Mrs. J. H., aged 42, the mother of fourteen children, a corpulent woman with a pendulous abdomen. Aside from the fact that in some of her labors there were breech presentations, there was nothing of interest or out of the ordinary in her former obstetrical history. In the present gestation she had gone three weeks beyond the usual time with but little evidence of beginning labor. There was no dilatation, the cervix being so far backward and upward that it could hardly be felt, but it was not difficult to determine that we had a crossed presentation, the child's head lying in the mother's left side. The family physician, Dr. C. K. Beck, believed Cæsarean section was necessary and so informed the patient. She consented to the operation and was taken to the hospital and I was called to assist. I might explain that Dr. Beck was formerly my assistant, and it was at his own request that he acted as first assistant in this case, as he is now doing his own surgery, and it was through his courtesy that I was asked to operate upon this patient.

After one day in the hospital with the customary care and preparation, the patient being given pituitrin prior to operation, Cæ-

sarean section was performed in the regular way. The uterus was found unusually large and there was more than one gallon of amniotic fluid. During the progress of the operation no trouble arose to necessitate any change in the usual *modus operandi*. A fibroid tumor the size of a man's fist was found in the uterine wall at the utero-cystic fold and it was decided to do a modified Porro. Not an untoward symptom developed following the operation and the patient left the hospital well on the ninth or tenth day. She and the baby have remained in good health, this being her fifteenth child.

Case 6. Mrs. R., aged about 25, primipara, was approaching labor when she called Dr. F. M. Melton, who discovered that her pelvis was abnormal and sent for me. Examination revealed a typical Nagele's pelvis due to the weight of the body being constantly carried on the right leg during life, or at least from early childhood, because of a diseased left hip-joint. This had resulted in ankylosis with the left leg forward over the pubic arch and against the right leg. The patient had walked the most of her life on crutches and the one normal (right) leg. Under the roentgen-ray this woman's pelvis had the appearance of simply a "half pelvis," the right side being displaced toward the median line.

Cæsarean section was performed in the usual way without an untoward incident. The patient was informed that if she again became pregnant another Cæsarean operation would be necessary, and at her request the tubes were ligated for the purpose of sterilization. She made a quick recovery, and both she and the baby have remained in good health.

Case 7. Mrs. G., aged 20, primipara, called me to see her in labor. Upon examination it was plainly evident that the child could not be delivered through the normal channel on account of a rachitic pelvis which was not only generally small but the antero-posterior diameter was not more than two inches. Dr. Edward Speidel was called in consultation and concurred in my opinion.

The patient was taken to the hospital and delivered of a ten-pound boy by Cæsarean section, and the tubes were ligated at her request. She made a slow recovery, remaining in the hospital, as I recall, about four weeks. She was never free from chronic endometritis, notwithstanding one or two curettings, until I finally did a supra-vaginal hysterectomy one year after the Cæsarean section. She has since been in good health and the baby is also living and well. I would like to add that Dr. Speidel remained with me in this

case throughout the post-operative Cesarean treatment and rendered very valuable assistance.

DISCUSSION:

H. A. Davidson: Dr. Speidel presented the latest treatment for puerperal eclampsia. When it comes to the treatment of such cases most obstetricians have to decide between three forms of management: (a) either rapid method of delivery, (b) or the slow Stroganoff (McPherson) method, or (c) a median course between these two plans. Most obstetricians today I believe prefer the rapid method of delivery, although in view of the statistics presented by Dr. Speidel it may be that the treatment will tend toward the slower method with greater benefit to both mother and child.

Dr. Peak's paper and the clinic he has presented are very interesting and instructive. He showed us a number of cases which gave the indications for Cesarean section. The pictures he has presented should be remembered by all of us. I happened to be present as the obstetrician in one of his operative cases. The operation was performed very skillfully, and as you have seen the mother and child are living and well.

The discussion of pituitrin is somewhat aside from the papers. Dr. Peak did not mention the use of pituitrin in obstetrics, he used the drug as a surgical procedure after delivery of the baby. In surgery we use pituitrin frequently, particularly to prevent gaseous distension of the intestines, and it is very successful for that purpose. It is also used to increase the flow of urine. Dr. Peak, I understand, gave pituitrin to prevent distension of the intestine, to increase the flow of urine, and incidentally to also cause contraction of the uterus. It acts very much like a physiological contraction and I cannot think of any other drug in the entire pharmacopeia which will cause uterine contraction as nearly physiological as does pituitrin.

I am not afraid to say that I use pituitrin a great deal in obstetrics. Since pituitrin has come into general use I have discarded forceps almost entirely. Instead of pituitrin being detrimental I have found it decidedly beneficial, and I should say that in at least ninety-five per cent of cases where pituitrin is now given I would formerly have resorted to forceps. We are all doubtless aware of many instances where babies have been injured by being dragged through the birth canal by the application of forceps, causing paralysis and serious hemorrhage into the brain and various other injuries due to trauma from the use of forceps. According to my experience the application of forceps entails greater dangers than the administration of pituitrin.

Dr. Peak stated that in two cases he ligated

the Fallopian tubes to prevent future pregnancies. I would like to ask him how he ligated them. I notice the children in these two cases are four or five years old. Evidently the mothers have had no succeeding pregnancies. It is a well known fact that ordinary ligation of the Fallopian tube will not prevent future pregnancy in most cases. I would like to know what procedure he used in these cases. It has been the history in a great many cases where the tubes were ligated that it did not prevent future pregnancy.

A. W. Nickell: Internists have to deliver a great many women and we are familiar with the complications that have been mentioned. This meeting has been an inspiration to me; it is one of the best we have had for a long time, and we ought to have more of this character.

Dr. Speidel has presented a very interesting resume of the treatment of puerperal eclampsia. I did not discover anything particularly new in his paper, at least it contained nothing that we have not known for the last two or three years. It is unfortunate that a greater percentage of pregnant women do not present themselves for frequent examinations, and bring numbers of urinary specimens, before the toxemia has affected the central nervous system.

The physicians are the first to see these cases and their diagnostic acumen should be well whetted. In their pregnant patients they should be on the lookout for certain danger signals, viz., digestive disturbances, rapidity of pulse, anomalies of vision, edema and headache. Always fear eclampsia if there are signs of kidney disease or disturbance of function during pregnancy. In four-fifths or more of pregnancies gestational toxemia is first manifested by marked and increasing albuminuria. Be sure to stress the significance of blood pressure findings, for increasing blood pressure is the most constant symptom of gestational toxemia in the latter half of pregnancy and an invariable precursor of eclampsia. Now if we will be timely in this matter and do these things capably and conscientiously we will unquestionably emancipate a large percentage of these women from this awful scourge.

If we will keep a line on the cardio-reno-vascular system, use proper dieto-therapy, keep the channels of elimination well open, with rational exercise, bathing and other accessories pertaining to the hygiene of pregnancy at the proper time, we would not have eclampsia to contend with so often as an end-result. The laity should be educated along this line.

Dr. Peak has presented the best paper I have heard read before this society for a long time. He has given us the indications for Cesarean section and we have seen the results of his splendid work. He has presented the records of nineteen cases with one fatality, a record of which

he should be justly proud. His work has really been remarkable from a surgical standpoint. I believe the majority of obstetricians now agree upon the indications for Cæsarean section as given by Dr. Peak. We are all familiar with the injuries inflicted upon both the mother and child during difficult forceps delivery, especially where high forceps application is necessary, and in all doubtful cases I believe the Cæsarean operation should be given preference. It is safer for both the mother and child.

Ben Vaughan: I think Dr. Nickell struck the keynote in what he said about seeing the patient beforehand. It has been my misfortune to see a number of cases of eclampsia, but have had only one such case where I had an opportunity of seeing the patient beforehand. I had only seen that patient one time. I am of the opinion that eliminative treatment will prevent most of these cases. If the patient can be educated to report to the doctor immediately when symptoms begin to develop, by proper treatment most of the cases of eclampsia can be prevented.

In regard to the etiology of eclampsia: I have never seen anything mentioned about the importance of infection in these cases. I have seen two or three cases where there was a great deal of infection elsewhere in the body. The patient who developed eclampsia after I had seen her once belonged to this class. She had two or three convulsions and it was decided to induce labor immediately. When the vaginal speculum was introduced a large quantity of pus was found. Dr. Leon K. Baldauf saw the patient with me and agreed that infection might be the cause of the eclampsia in this case. The woman developed peritonitis, was later operated upon and several pus sacs opened. In another case a woman who had eclampsia was operated upon afterward and a large amount of pus found around the kidney. I believe Dr. Peak said in one of his cases empyema developed and he had to resect a rib. I am of the opinion that infection added to other conditions sometimes brings on eclampsia.

In the treatment of eclampsia I disagree with what Dr. Davidson has said. He stated that the trained obstetrician of today favored the method of rapid delivery. I believe it is just the opposite, and obstetricians are beginning to advocate more conservative methods. The statistics of Stroganoff and McPherson prove that the slower method is the safer method to pursue. I doubt if Cæsarean section is ever justifiable in the treatment of eclampsia. I wish to modify this statement in that eclampsia, per se, should not be treated by Cæsarean section. Of course where eclampsia is complicated with something else, the operation is for the complication. Even if the patient is a primipara, if there are no other complications, it is better to pursue the conservative method. If the convulsions cannot be

controlled with morphine, and if proper elimination cannot be secured, the shock of Cæsarean section is going to be enough to kill the patient.

In regard to the indications for Cæsarean section: I am of the opinion that the indications are less numerous than the majority of surgeons have stated. Entirely too many Cæsarean sections and forceps operations have been performed. The surgeon or physician who is constantly looking for indications is likely to find a great many of them. In one of the New Orleans hospitals they delivered one thousand babies and only used the forceps four times. No Cæsarean sections were performed in this series of cases and no pituitrin given. These statistics show how infrequently nature has to be aided in effecting delivery.

As to the administration of pituitrin: If the instructions of Bandler are followed closely (and he is the great advocate of pituitrin) you will never have occasion to give it. He emphasizes the fact to wait until the head is through the superior strait, thorough dilatation has occurred, and the membranes ruptured. I think in this he is eminently correct, but after this has occurred you do not need pituitrin. When this stage of labor is reached, the patient should be given a little chloroform or ether in order to retard labor and save the perineum. I think pituitrin has a very limited field and is usually given to save time.

C. H. Harris: I have been in the practice of medicine a good many years and have delivered fifteen hundred babies. I have had numerous cases of puerperal eclampsia, and have been fortunate enough never to have lost a woman from that cause. I do not know anything more about puerperal eclampsia than anybody else, but have been fortunate enough never to have seen a woman die from puerperal convulsions.

Dr. Speidel told us in a paper some years ago that it was the practice to perform phlebotomy on eclamptic women. I have done that numerous times. It is a very simple thing to put a tourniquet around the arm and open the median basilic vein and bleed anybody. The blood pressure is lowered by this procedure, the system is drained of toxins, and the eclampsia ceases. The administration of morphine and chloroform may also be necessary in some cases. The cause of puerperal eclampsia so far as we know is toxemia; the blood is loaded with toxins and the quickest way to eliminate is by bleeding. The blood pressure in these cases is only symptomatic, it means nothing except it is conservative, nature raises the blood pressure to try and drive the blood through the kidney in order to eliminate the poison.

Blood pressure to me means absolutely nothing. For example, I have under observation a man whose blood pressure has been so high for

the last five years that neither the Merzer nor the Tycoos instrument will record it; consequently this man's blood pressure must be over 300 mm. Hg. Under bromide of potassium, careful diet and rest the patient has gotten along in comparative comfort. Blood pressure has never meant anything to me except it shows there is an arteriosclerotic condition of the blood vessels. In this way of course it is an aid to diagnosis.

I have seen one woman delivered with surprising ease where the promontory of the sacrum could be felt with the examining finger. I have never had to resort to hebotomy in any of these cases. In a few instances this operation might have been performed to give greater room, but I have always managed to get along without it. I do not believe the necessity for Cæsarean section arises very often. I have had two cases in all my experience where I thought operation was indicated. In both cases it was refused. In one case I did a craniotomy and delivered the child piece-meal. The woman made a good recovery. In the other case there was a very large child and the woman was small. I attempted for five or six hours to deliver the woman, Dr. Speidel was then called to help me, and we finally delivered the woman but destroyed the baby. That woman also lived. I advised in this case that the patient be sent to the hospital for Cæsarean section, but my suggestion met with refusal.

In Dr. Peak's case of course it is unfair for anyone to criticise without knowing the details. Dr. Peak is a surgeon and as a matter of course would be apt to see more of these cases than anybody else as that is his line of work. I would, however, draw some very serious conclusions as to the necessity of performing Cæsarean section for the delivery of a woman who had already given birth to fourteen children no matter what the position in the uterus might be. It is easy to perform podalic version in a woman who has borne a large number of children. That is one thing I see in Dr. Peak's case that I want to criticise. I believe I could have delivered this woman through the normal route; I could deliver any woman who has already had fourteen children. I would never have advised Cæsarean section in that case.

The woman with hip joint disease and distorted pelvis probably could not have been delivered in the normal way; but I have seen a number of women whose pelves were "twisted all out of position" give birth to their babies through the normal channel. I believe the majority of them can be normally delivered if the obstetrician will let them alone for a while.

I want to say a few words about pituitrin: Of course we were told when pituitrin was first advocated (pituitrin is the extract of the pituitary body) that the reason labor began at a certain time in women we did not know; nor do we

know yet positively. Why does it take a cow eleven months before it gives birth to its young, and why do rabbits multiply so rapidly? Why does a woman go nine months before she has her baby? What is the explanation of labor beginning at that time? The best explanation today is that there is some form of toxin eliminated by the fetus which is taken into the mother's circulation and activates the pituitary body which in turn excretes its own pituitrin. That is why we use pituitrin. I have been in the habit of giving pituitrin when the cervix was fully dilated, especially where there was inertia or lack of ability on part of the uterus to complete its work. I always delay the administration of pituitrin until everything is ready. I have never had a case in which I have given pituitrin that I did not deliver the baby within twenty minutes. I do not believe it is right to give pituitrin before the cervix is dilated and everything ready for the baby to be delivered. Like Dr. Davidson my obstetric forceps have been discarded since we have had pituitrin.

Dr. Vaughan said he gave pituitrin when he was in a hurry. That is the saddest commentary that could be made by any medical man. No physician can afford to be in a hurry in the application of therapeutic methods, and especially is this true in the administration of a powerful agent like pituitrin. The first thing Dr. Vaughan knows he will have a ruptured uterus by giving pituitrin because he is in a hurry. No physician has the legal, moral or professional right, although he is privileged because of his profession from a great many standpoints, to jeopardize anybody's life because he is in a hurry.

Pituitrin is a remedy that has come to stay; it will never be discarded. I have simply referred to its use in obstetrics. I do not believe we have ever had another remedy which will cause, as Dr. Davidson expressed it, a physiological contraction of the uterus, i.e., intermittent contraction of the uterine musculature. It seems to do nothing but stimulate the uterus to do its work; it does not cause tonic contraction, but stimulates clonic, normal, or physiological, contraction. When the woman is ready to be delivered, the position of the child and everything else being right and proper, I would feel negligent if I did not try pituitrin before subjecting that woman to forceps delivery. And this is the big point in the whole thing, no one can be absolutely certain that his forceps are sterile before being introduced into the woman's vagina; and especially is this true in private practice. It is customary to wrap the forceps in sterile towels, and also to use lysol or some other antiseptic; but no one can be sure of complete sterilization, and there is always an element of danger. The administration of pituitrin obviates this danger.

I wish to reiterate that when the child's head

rests on the perineum, when the cervix is dilated, when the membranes have ruptured, inject pituitrin into the gluteal muscles and get ready to deliver the baby, as you will have it within twenty minutes.

Chas. K. Beck: The remarks of Dr. Harris call me to my feet. It so happens that the case in which he criticises the operator for performing Cæsarean section was my patient. The reason for advising Cæsarean section was not because of the presentation. There was no contraction of the pelvis and there was plenty of room. But this woman had a fibroid tumor at the juncture of the cervix and the body of the uterus, the cervix being so high that it could barely be touched with the examining finger. The woman had been in bed for three weeks having labor pains now and then, but it was absolutely impossible to deliver her. I have not delivered as many babies as Dr. Harris has, but have had a fair obstetrical practice during the last thirteen years. This is the only Cæsarean section I have had performed in my entire experience. However, I have had one other case where the woman would have been delivered by this method had I known in advance the difficulties that were going to be encountered. The woman had been in labor for thirty hours, she was rapidly becoming exhausted, and had complete uterine inertia. I called a colleague to administer an anesthetic and applied forceps. The cervix was dilated but the head had not engaged. Delivery was completed by high forceps operation in one hour and twenty minutes. When forceps were applied I discovered that the antero-posterior diameter of the mother's pelvis was only two and a half inches, and when I was through a twelve-pound boy had been delivered. It was an L. O. A. The perineum was not lacerated to any great extent, but there was a tear in the cervix extending upward to the junction of the cervix with the body of the uterus. That child has a scar on his head which he will carry to the grave. I broke the right humerus in delivering the child, the only bone I have ever broken in my obstetrical practice. While both mother and child are living, this woman has since become pregnant and carried the child about three months and miscarried. She ought to have some plastic work done on the cervix, but has never consented to set a time for the operation.

I think it is well to always be conservative in the management of obstetrical cases, but conservatism must not be carried too far. Dr. Peak has done some splendid work as illustrated by the cases he has shown us, and he is to be congratulated upon the results secured. I feel that I have been conservative in my obstetrical work, as only one patient has been subjected to Cæsarean section—although the operation should have been performed in another.

In regard to pituitrin: I use this to some extent, and the patient you have seen, the mother

of fourteen children upon whom Cæsarean section was performed, was given two full obstetrical doses of pituitrin without result. The other patient delivered by high forceps operation also had two full ampoules of pituitrin. I use pituitrin occasionally and give it in small doses. As a rule I give two or three minims and await results. It is in large doses in my opinion that the danger comes from the use of pituitrin. Give small doses repeatedly if necessary and proper results will be secured from the administration of pituitrin. By following this plan the forceps may frequently be laid aside.

A. R. Bizot: I believe we all enjoy criticism, and we all try to practice conservative rational medicine. It is folly for anyone to say he does not believe in giving pituitrin, that he does not believe in Cæsarean section, that he does not believe in forceps delivery, etc.—all these things are necessary in certain cases. When Cæsarean section is indicated it will be done. I do not believe every patient with eclampsia should be sent to the Cæsarean table; on the other hand, there are certain cases of eclampsia that have no other place except in the operating room. In a case which Dr. Peak asked me to see we would have had a dead woman and a dead baby if there had been no such thing as Cæsarean section. This lady I saw in the Jewish Hospital. She had the most marked edema that I have ever seen. Every part of her body was involved; she was in convulsions and had been for a number of hours. I catheterized that woman and boiled the urine myself, and after it was boiled the specimen was solid. The woman was cyanosed and was in a most serious condition. She was taken immediately to the operating room and prepared for operation. Dr. Peak made a rapid incision and I controlled the uterus from below as he has described. The uterus was quickly emptied and the usual procedure of cleansing observed. The patient had one or two slight convulsions after the operation. Within forty-eight hours the edema had begun to subside and the woman made a satisfactory recovery.

It is all right to talk about conservatism in cases of this kind; on the other hand do not let your patient die because of the need for Cæsarean section. "Again do not shoulder your tonsillatome and go Cæsarean hunting."

H. J. Phillips: There are four ways in which to deliver a baby: (1) by the natural route through the efforts of the mother herself; (2) by forceps in the hands of the obstetrician; (3) by craniotomy performed by the obstetrician; (4) by Cæsarean section at the hands of the obstetrician or surgeon.

We know that forceps should not be applied when the pelvic diameter is less than three and a quarter inches, because the child, if it is born alive will probably be badly disfigured and may

die, and the soft parts of the mother will likely be seriously lacerated. Whenever the diameter is less than two and a half inches we should resort to craniotomy.

Nothing has been said tonight about the operation of craniotomy. I am inclined to believe it is a conservative measure to do a craniotomy even upon a living child and preserve the life of the mother, because in so doing we are benefitting the future of the race in that the mother can give birth to more children. Consequently, when the conjugate vera is two and a quarter inches, or even two and a half inches, craniotomy should be performed in suitable cases.

I have always contended that the suregon is not the one to decide when Cæsarean section should be performed. It should be the man who is accustomed to examine the pelvic outlet, one who is familiar with the birth canal, and who can tell exactly its size and diameters. A man who delivers a great many women examines the pelvis with the idea in mind of delivering the child: the surgeon on the other hand very rarely examines a woman with this point in view; and if he does do so it is only occasionally and the importance of the various diameters has not been impressed upon him.

It is true that the improvements made in Cæsarean section and the results obtained have caused us to employ the method in cases in which fifteen years ago the procedure would not have been considered justifiable. Primarily, it was done for deformity of the pelvis and for tumors of the uterus. Now we include in that list eclampsia, accidental concealed hemorrhage, and placenta previa.

The operation of Cæsarean section, per se, is a very simple matter. I do not believe it is proper to abandon the conservative idea of surgery and remove the uterus when Cæsarean section is performed. The uterus should be incised and the baby extracted and the uterine wound closed by suture. It is as simple as any other abdominal operation, and yet in the presence of sepsis it is most formidable as to mortality.

I have always been taught that sepsis was the great thing to fear in these cases. Many women are sent to the hospital well advanced in labor; they have been examined by one man after another, even by midwives, and attempts have been made to deliver them, perhaps with unclean hands and unclean instruments, etc., and all of these things add to the danger of sepsis, and yet we are told by Dr. Peak in his essay that he has delivered nineteen children by the Cæsarean method with but one death. That is a remarkable record and I wish to congratulate him on it. But is his record a safe criterion? Should we not rather endeavor to compile further statistics along this line in order to judge what the mortality is in Cæsarean section? It is looked upon as a serious

operation so far as the mother is concerned, and the child is also sometimes lost. Twenty per cent is the mortality given by most observers.

I want to repeat that I object to removal of the uterus in simple cases requiring Cæsarean section. If there happens to be pelvic deformity which would contraindicate future pregnancy, it is well then to remove a part of the Fallopian tubes to sterilize the patient; but the most conservative surgery is that in which the uterus is left in situ thus giving the mother an opportunity to bring forth further children.

Edward Speidel, closing: I hope you will pardon me for violating the rule and discussing the subject of pituitrin which has been so broadly broached. It is very difficult to reconcile the views expressed by obstetrical authorities on this question at the present time. Anyone who reads the Journal of Obstetrics and Gynecology will be astonished at the articles published in that journal. One has recently appeared by DeLee and another by the distinguished obstetrician Watson, of Toronto, Canada. The latter advocates the use of as high as ten or twelve ampoules of pituitrin in the first stage of labor. DeLee performs episiotomy and delivers by forceps in primiparae as soon as the head reaches the floor of the pelvis. He gives one ampoule of pituitrin in the third stage of labor and then inserts his hand into the uterus if the placenta does not come away at once. In his last text book he advocates small doses of pituitrin especially in placenta previa.

I do not see how it is possible for anyone to follow the teachings of the leading obstetricians when they publish articles of this kind. I use pituitrin in three minim doses in the second stage of labor and have found this plan often makes the application of forceps unnecessary. It has been proven that compression of the child's head by forceps is oftentimes very injurious.

The leading obstetricians in this country have endorsed McPherson's method of treating eclampsia. The veratrum viride treatment so far as I can learn is not now advocated as much as formerly. Edgar is now using McPherson's plan. Whether Zinke has abandoned the veratrum viride treatment or not I am not prepared to say.

No doubt young women of the present day are better developed than ever before physically, and that is due to the higher class of women playing tennis, golf, and indulging in other forms of athletics. However, it also seems to be true that the baby's head has grown larger and harder in consequence of our higher civilization. I think that is where the difficulty in labor sometimes arises. This is frequently noticed in the second stage of labor.

As to Cæsarean section: Everyone knows that every now and then there will be observed women with badly contracted pelvises, and in spite of the contraction the patients will deliver themself-

ves. Anyone who will read the articles recently published on contracted pelvises will find these facts plainly stated. Nature will sometimes "slip the child through" regardless of the contraction, consequently the proper treatment in such cases is not immediate Cæsarean section. Nature should be given a chance and if she does not succeed in effecting deliver, the Cæsarean operation may then be performed. We should wait until the cervix is well dilated before resorting to radical measures. In a case in the Louisville City Hospital, in a dwarf, that is exactly what we did, and the woman was delivered normally in spite of the pelvic deformity. We have two cases under observation now where labor is expected within two months, and on account of pelvic distortion both these patients may have to be delivered by Cæsarean section. On the other hand, delivery may be accomplished in the normal way without even a vaginal laceration. If they are fortunate enough to be delivered without Cæsarean section so much the better. I am inclined to think, however, that where we have this form of dystocia the woman should be delivered by Cæsarean section.

I have had a number of cases where the position was persistently occipito posterior in which the membranes ruptured very early in the labor, where the patient was in labor for two or three days, but I finally succeeded in effecting delivery by manual rotation and forceps. In every one of these cases, however, there was considerable laceration of the soft parts which was not caused by the forceps. In one case I noticed that the perineum was torn before the head rested on the perineum. That accident happens not infrequently in occipito posterior presentations because there is no moulding of the head; the head is firm and not being moulded will not pass through the pelvis without producing some damage. I believe in such cases Cæsarean section is the most conservative method of delivery from the standpoint of both mother and child.

I am sorry Dr. Peak did not say something about the high Cæsarean operation. I have performed fourteen high Cæsarean operations with a maternal mortality of two and no fetal mortality.

As to craniotomy on a living child: I would never perform craniotomy on a living child for this reason—if the pelvis is so distorted that the baby cannot be brought through the birth canal, then there is more danger in performing craniotomy with the clumsy out of date craniotomy instruments than there is in performing Cæsarean section. I would certainly prefer Cæsarean section with a living baby when the mother's pelvis is badly contracted.

J. Hunter Peak, closing: I wish to thank the gentlemen who have discussed my paper. I do not care how much any of you disagree with me.

Kindly criticism is one of the objects of medical societies, and every individual is entitled to express his own opinion. None of us can claim perfection, and we can all learn something from the interchange of opinions. If anyone differs from me at any time about any procedure, I am always glad to listen to his views as they may be of value to me in the future. I do not care how radically anyone may differ, nor how much criticism is offered, I am always pleased to listen.

Dr. Davidson asked a question about ligation of the Fallopian tubes: I have always been under the impression that careful ligation of the tubes would positively prevent further pregnancies. There is nothing unusual about the technique of this simple procedure; a ligature is placed around the tube and tightly tied; there is no question in the world about the lumen of the tube being destroyed by this method; and if this is true I do not see how it is possible for the woman to later become pregnant. If desired the tube may be ligated in two places and a section excised as an extra precaution. For the purpose of sterilization, however, a ligature is merely placed around the tube and tied, the ends being severed and the tube allowed to recede into the cavity. This will effectually destroy the lumen of the tube and prevent future pregnancy.

The tubes were ligated in the young woman with Nagele's pelvis who was just before you; she has since remained in perfect health and there have been no further pregnancies. Another of the women exhibited continued to have trouble after ligation of the tubes. Dr. Speidel will recall that case as he saw the patient with me on several occasions while she had no serious infection there was always more or less discharge from the cervix which was attributed to so-called chronic endometritis. This continued for one year and finally hysterectomy was performed. She has since remained in perfect health. If a woman is to remain sterile I can see no reason why a supravaginal hysterectomy should not be performed. This is far better in every way for the woman in my opinion. By this method of procedure the surgeon eliminates the possibility of many things.

So far as craniotomy is concerned: I am very glad Dr. Speidel said what he did. I have never yet gotten my courage to the point where I could kill anybody, and craniotomy means destruction of the child. If the child was already dead I might perform craniotomy if I thought there was no better way out of a serious difficulty; there would be no moral responsibility if the child was dead; but even in contracted pelvis with a dead child I believe the safer plan for the mother is Cæsarean section rather than craniotomy. With the large, clumsy, heavy instruments generally

used in performing craniotomy, the child is not only destroyed but torn to pieces and has to be delivered by morcellation; the soft parts of the mother are also likely to be seriously damaged, and infection may supervene which will cause the woman to lose her life.

In performing Cæsarean section there is no mutilation of the child, and the mother merely has a clean surgical wound. It must be remembered that the infant is more your patient if anything than the mother, because it is absolutely helpless and hopeless unless the surgeon does his full duty. He cannot constitute himself a judge nor an executioner, and if the baby is alive Cæsarean section properly performed will save the lives of both.

The old idea that Cæsarean section is an exceedingly dangerous surgical procedure is an absolute fallacy. I have never seen any serious infection develop even of the abdominal wall following the operation, and all the patients have recovered except the one mentioned in my paper who practically bled to death before I was called. In this case both mother and child were lost.

I am perfectly aware that nineteen cases is no criterion, but it is equally true that if the surgeon knows how to perform Cæsarean section and does it properly, just as he would any other abdominal operation, he will save a great many of these unfortunate women whose lives might be lost by the ultra-conservative methods mentioned by some of our distinguished medical friends. I do not believe destruction of the baby at any time is ever justifiable. Cæsarean section is not now considered a serious operation. Both physicians and surgeons are becoming wiser; this must always be taken into consideration.

Someone remarked upon the fact that I had seen so many cases requiring Cæsarean section. For ten or twelve years I was engaged in the general practice of medicine and during that time had quite a large obstetrical clientele. It may seem strange, but in all that time I never had a single obstetrical case where I thought a Cæsarean section was necessary. It was not because there were in those days no women upon whom the operation should be performed, but I did not happen to see them. It may also sound strange, but during the time I was engaged in general practice I never saw a case of puerperal eclampsia, and have only seen two since. Both of these were operated upon and one has just been before you. She was in an extreme condition and something had to be done quickly to save her life. The general edema was very extensive and the patient was critically ill. I do not recall whether she was passing any urine or not, she could not be catheterized because the vulva was so swollen that this procedure was impossible. My recollection is when Cæsarean section was performed her bladder was found empty. In the

case mentioned by Dr. Bizot there was barely sufficient urine obtained by catheter for examination. If the patient had voided any it was involuntary during her convulsions. In both these cases of eclampsia Cæsarean section was performed, and I believe it was the most conservative plan that could have been followed under the circumstances. In my opinion no honest surgeon will disagree that the method pursued was the best and quickest way out of serious difficulty; and subsequent events have proved that my judgment was correct. The woman mentioned by Dr. Bizot has since given birth to two children through the normal channel. However, her vision has never returned. The patient I have exhibited was nearly blind at the time of the operation but she now has useful vision.

I do not believe anybody knows the real cause of puerperal eclampsia. In my opinion, there are two factors which may have something to do with it. One is something liberated by the fetus which enters the circulation of the mother. The other is something which is present in the intestinal tract of the mother. Many of these women, however, do not seem to complain of any intestinal symptoms until the advent of eclampsia. In the case I have reported the woman engaged her physician to take care of her during labor, she was given instructions in regard to diet, etc., and I believe she had two or three convulsions and was then apparently well for several days; but she did not observe instructions and finally became seriously ill when convulsions again supervened. At the time I saw her there was nothing left to do but perform Cæsarean section if we expected to save both mother and child. In all the other cases reported—Nagele's pelvis, uterine fibroids, etc.—there was no question about the necessity of Cæsarean section.

I am a little surprised that no one has criticized me about sterilization of the women. In every instance in which this was done it was at the urgent request of the patient. As stated in my paper, this is a matter which I believe the woman should be allowed to decide for herself, and if she is to remain barren it is considered by many surgeons safer to resort to the modified Porro operation.

Cæsarean section today is very little more dangerous than an ordinary obstetrical case handled in the usual way; and if a woman desires it she ought to be permitted to have her child that way. There are on record cases where women have been successfully delivered of five children by the Cæsarean method, and I have personal knowledge of one woman who has given birth to two children in that way.

While I do not advocate sterilizing every woman upon whom the Cæsarean operation is performed, in a few instances I have done this, as stated in my paper, because of their plea that

they did not want to pass through another similar experience. All of these patients whom I have sterilized have been those with deformed pelvis or tumors and in whom normal labor would have been impossible.

CHRONIC PARENCHYMATOUS NEPHRITIS*

By H. A. GILLIAM, Bardwell.

There are two types of chronic nephritis, viz., parenchymatous or exudate, and interstitial or non-exudative. In this paper I will deal only with the parenchymatous or exudative.

Chronic parenchymatous nephritis is a chronic diffuse inflammation of the kidneys, attended with epithelial degeneration, exudation from the blood vessels, and permanent connective tissue changes in the stroma.

At first the kidney is usually enlarged and pale or yellow in color, and is called the large white kidney. Its surface is smooth and the capsule is easily stripped off. On section, the cortex is broader than normal, is yellowish white throughout or may present a mottled appearance of yellow and white areas with mottlings of red. The pyramids are more or less congested. The microscope shows the epithelium to be swollen, hyaline, granular or fatty, and more or less disintegrated or flattened; the glomeruli were enlarged from the growth of the capsule cells, and of the cells covering the capillaries, and in some case owing to the connective tissue thickening of the capsule, the tuft of capillaries is found to be atrophied. The interstitial tissue shows some thickening of the arterial walls and a moderate growth of connective tissue in patches around the glomeruli and tubules; the latter contain hyaline and granular casts.

As the inflammation advances, degeneration of the epithelium, and growth of connective tissue becomes more pronounced. After a time cicatricial contraction sets in and the kidney becomes smaller. The surface is slightly granular, and the capsule is harder to strip off. The color is grayish or yellow and may be mottled with red spots. The kidney is firm, and on section the cortex is seen to be narrow and shows yellowish white foci of fatty degenerated epithelium. At this stage the kidney is sometimes called the "small white kidney" or small granular, " or "fatty kidney." With the increase in growth of interstitial connective tissue there is atrophy of the parenchyma. There may be more or less waxy degeneration.

If the disease assumes the hemorrhagic form, the kidneys are large, swollen, red and congested looking or mottled and sometimes nodulated. Hemorrhagic spots may be seen on the surface. The capsule is slightly adherent between the nodules. On section the kidney will be congested looking and yellowish or grayish looking spots, due to fatty degeneration and anemia may be seen. In the cortex will be seen hemorrhagic areas which are distinctive of this type. The histologic appearance is about the same as of large white kidney with the addition of the changes found in acute nephritis.

Etiology: The disease may follow the acute diffuse nephritis, as of scarlet fever or pregnancy, or simple chronic congestion and chronic degeneration of the kidneys. Though more often it comes on more insidiously, without any symptoms apparent, so that the patient is unaware of his trouble till it has become subacute or chronic. Very often no cause can be found. Though it is very likely that a foci of infection somewhere, maybe undiscovered, is the determining agent. Living in low, damp, marshy climates, exposure to cold, continued use of beer and other alcoholic drinks, tuberculosis, syphilis, and malaria, and chronic suppuration may have a determining influence. Heredity also plays a very important role, in some cases. Females are less subject to it than males, especially so in adult life. In children it is usually the result of an acute nephritis following some of the infections diseases. It is more common in young adults than in old people.

Symptoms: As a rule in the early stages the symptoms are nil, or at least so insignificant that the disease is unsuspected till it has reached the subacute or chronic stage. If it should be the continuation of an acute nephritis as that following scarlet fever or pregnancy, there will be a continuation of the acute symptoms though in a milder degree. Some of the earlier symptoms are loss of appetite, weakness, disturbances of digestion, nausea, headache, stupor, dullness and anemic appearance. Later on there will be disturbance of vision, puffiness of eye lids and face and swelling of the feet and legs. The swelling of the feet and legs is worse in the latter part of the day and gradually goes out during the night, while that of the face is worse in morning and gradually subsides as the day passes. The swelling gradually extends upward till the entire body is affected and the serous sacs contain more or less anasarcaous fluid. The specific gravity of the urine is increased and the quantity diminished, except in late stages, and when absorption of dropsy is taking place. The urine contains albumin in varying proportions, sometimes as

*Read before the Carlisle County Medical Society.

much as three-fourths by volume. Urea excretion is diminished, sometimes as low as 60 per cent of the total nitrogen excreted by the kidneys. Normal, 85 per cent. The urine contains an abundant sediment, consisting of red and white blood cells, epithelial cells, granular debris, and numerous casts, epithelial, narrow or broad hyaline, and fatty granular casts. The urine is turbid and sometimes smoky-yellow. If an acute nephritis is added the urine is scanty or totally suppressed.

Dropsy of the serous sacs causes dyspnea and other distressing symptoms, which are due mostly to the mechanical effect of the fluid. Dyspnea may be mechanical, toxic, nervous or cardiac in origin. Catarrhal bronchitis may be associated, and is a very prominent symptom in some cases. Edema of the larynx and lungs may come on suddenly and cause death. The left ventricle is hypertrophied, and finally it and the left become dilated.

Symptoms of uremia are present most of the time. Convulsions are not so common as in the interstitial type of nephritis. A fatal termination may be preceded by headache, nausea, vomiting, vertigo, stupor, insomnia, diarrhea or delirium.

Dimness of vision and spots before the eyes are due to albuminuric neuroretinitis. The temperature is normal in uncomplicated cases. The duration of the disease varies, six months to five years or more, according to the type. Secondary contracted kidney lasts the longest, then next the hemorrhagic type. The large white kidney lasting six to eighteen months. The disease may continue from bad to worse till death ensue within a few months to a year or two, or there may be remissions and the patient drag along for several years with few symptoms. The albuminuria persists.

Diagnosis: It is not difficult to diagnose the disease itself, but may be impossible to tell what stage it is in sometimes. Urinalysis, pasty, pallid complexion, and dropsy are significant and usually sufficient features of exudative nephritis. Phenolphthalein and methylene-blue are retarded in their elimination.

The urine is more scanty and of higher sp. gr. in larger white kidney than in small white contracted kidney. Casts are also broader and not so darkly granular in the large white kidney. Hemorrhagic form may be distinguished by the presence of erythrocytes and blood casts in the urine, and a history of alcoholism.

The following points of difference between chronic exudative and chronic non-exudative nephritis may be noted:

CHRONIC EXUDATIVE NEPHRITIS

Occurs in early or middle life.

History of previous acute attack of scarlet fever or may be of alcoholism.

Onset gradual or markedly manifest.

Dropsy.

Vascular changes and cerebral symptoms comparatively uncommon.

Albuminuric retinitis common.

Albuminuria marked, and many short thick granular casts.

Urine diminished or but little increased and high specific gravity.

Anemia early and marked.

Uremic symptoms less severe.

Course two to six or seven years.

CHRONIC NON-EXUDATIVE NEPHRITIS

Occurs later in life.

History of gout, chronic lead poisoning, syphilis, excessive eating and drinking, nerve strain.

Slow, insidious and in definite.

Rare. Common.

Retinal hemorrhages and casts, chiefly hyaline, long and narrow.

Albuminuria slight, few choking of disk.

Urine excessive and low specific gravity.

Anemia slowly progressive and not so marked.

More severe.

Seven to thirty years.

Prognosis: Bad as to a cure. Life may be prolonged in some cases. It depends much excretion of urea and solids, and cardio-vascular and renal changes. Severe cases die upon the amount of urine passed daily and within a few months or a year, with uremia, cardiac dilatation, dropsy or complications. Those of a year's duration seldom recover. Children who have scarlet fever may recover, but rarely. Those who have the secondary contracted type never recover. Those whose blood contains over 5 mg. of creatinin per 100 c.c. invariably die in less than two months.

Treatment: Woolen under-clothes should be worn winter and summer, and should sleep between woolen blankets. Chilling of the skin must be avoided. Send patient to a warm climate in winter if they can afford it. Rest in bed if much edema or very weak, otherwise let them spend as much time out in the open as conditions will permit.

Diet, should be plentiful but carefully regulated. Skimmed milk and butter milk will have to be our mainstay, except in certain cases of severe edema, when the diet should be as near dry as possible without interfering with the nutrition too much. Dry bread, unsalted crackers, some vegetables, especially the watery kind. Bermuda onions are excellent. Dried beans and peas should be prohibited. Rice may be allowed, oats prohibited. Baked fish and breast of poultry allowed in moderation, other meats very sparingly. Fruits, as southern-grown grapes, citrus fruits, and sauce made from apples. The protein intake must be limited. Allow a great deal of water if not much edema, so as to eliminate solids. Small amounts of coffee and tea may be allowed in some cases. Salt should be left out of the diet, especially when much edema is present, or when the elimination of water is deficient.

Medicines do not seem to influence the disease very much. Of those used adrenalin chlo-

ride in 10-drop doses three or four times daily does good in some cases. Sodium bicarbonate given without much fluid sometimes lessens the albuminuria. Calcium chloride in small doses will increase diuresis. Dinretin is highly extolled by some. I am of the opinion that only the mildest of diuretics should be employed, as we already have an inflamed and irritated kidney and any diuretic that directly stimulates the flow of urine is bound to be irritating to the already crippled organ. They should be relieved of as much of their work as possible, through the skin, lungs and bowels. Thompson recommends that the skin be oiled daily and rubbed in with quite a bit of friction, then a warm bath of ten or fifteen minutes given. He also states that nothing influences the flow of urine so favorably as colonic flushings, once or twice daily, with plain water at a temperature of 110 to 115 degrees.

Special symptoms must be met with the indicated remedies. For the vomiting, one-drop doses of Fowler's solution repeated every fifteen minutes till six doses, then open the bowels with calomel five gr., and thirty-five gr. of compound jalap powder. Nothing in the way of food allowed but barley water or milk and limewater, equal parts. For diarrhea, a pill composed of silver nitrate one-eighth gr., powdered opium one-eighth gr., terebinthina resin four and one-half gr., and liquor potassa one and one-half min., given every two to four hours is very efficacious.

For cardiac weakness, infusion of digitalis or tincture of strophanthus, or if there is vasoconstriction then give nitroglycerine 1-100 gr. every two to four hours till effect.

For the anemia nothing is better than Bashan's mixture. If severe uremic symptoms develop, oil the skin as mentioned above, give a warm bath, or wrap in hot packs, give small dose of pilocarpin and hot drinks, look after the circulation, open bowels with compound jalap or some of the natural mineral waters, and treat symptoms as they arise.

In all cases the bowel must be kept acting freely, preferably by the use of the natural purgative spring waters.

Typhoid.—Flandin and Lemperiere apply ice to the whole abdomen and sometimes to the precordial region and give a cold drip enema, morning and evening, of 1 or 2 liters of artificial serum with glucose and a trace of epinephrin. They supplement this with an iodized vaccine (Ranque and Senez). They state that the course of the disease has been materially shortened by this treatment which does not interfere with the patient's repose.

MULTIPLE OSTEOCHONDROMATA IN MOTHER AND SON*

By JOHN D. TRAWICK, Louisville.

The subject of multiple osteochondromata has hitherto been accorded but little attention by medical writers. Unfortunately, the only reference literature of any value which can be found is German, and there is nothing of importance later than 1908.

Osteochondromata arise at the epiphyseal junction and are cartilaginous in origin, that is the mass itself begins in the cartilage. After development of the cartilaginous substance the main portion of the mass becomes more dense in structure. On the outer and upper surface of the mass there occurs a cartilaginous cap which in most instances is quite characteristic. Frequently this cap may be easily detached from the bony mass itself.

The patient represented by the lantern slides to be exhibited was referred to me because of the presence of several bony excrescences about the legs and feet which caused considerable deformity. It was noted upon examination that these masses sprang from the epiphyses. Instead of there being an actual valgus position of the feet, as appears in one of the pictures, the radiogram shows the arches of the feet in a fairly perfect state. The deformity is due to the encroachment of the osteochondromata upon the normal structures.

From the fact that there exists one of these osteochondromatous masses, it is almost certain others will be found, we made a complete study of the patient's skeleton, and were startled by the extraordinary number of these bony masses present. These growths generally occur upon the long bones, they are practically never found upon the flat bones according to the literature; but several of the pictures to be shown will demonstrate a few present on the ribs and shafts of the long bones.

History of the patient: At the time of our first observation the patient was about nineteen years old. His infancy had been rather stormy. He was peevish, fretful and irritable until the beginning of puberty. Until within the past few years he was considered "peculiar" in many ways; he was attractive on account of his superior intellect; but had "peculiar spells" as his father and mother expressed it. These seemed to be temperamental rather than distinctly mental in character. The Wassermann reaction was repeatedly negative; blood count as well as the blood picture and history of no interest because it was normal

*Clinical report read before the Jefferson County Medical Society.

The general glandular history was negative. So our attention may be focused entirely upon these bony growths.

From an orthopedic standpoint osteochondromata give no particular concern unless they interfere with joint function. In this case the boy had difficulty in walking, and a mass on the inner aspect of the knee joint gave him considerable discomfort from pressure of his clothing. However, the mass on his left foot was the one which gave him the most trouble and was the one removed surgically. The growths on the right foot were not of sufficient size to warrant surgical intervention. The operation for removal of the bony mass was a simple affair. The skin was incised and the extensor tendons pushed out of the way; then the periosteum was split and turned downward; the bony mass was easily removed with chisel. The wound was then closed and a simple dressing applied.

After we had completed study of the boy's skeleton, we found that the mother had several similar osteochondromatous masses on the femur and elsewhere. In the literature of the subject a great deal is said about the so-called hereditary tendency in connection with the development of osteochondromata. We know nothing about the influence of heredity in deformities of this kind, and the matter is merely mentioned in passing. Study of the mother's skeleton was quite interesting because it showed many duplicates of the bony masses which were found on the boy's bones.

The first picture is a radiogram taken laterally of the boy's left foot. It will be noted that the cartilaginous mass has a peculiar ragged appearance. This is the growth which interfered with function and was removed.

Unfortunately the second picture, also of the left foot, is of little value. It was taken from above downward and simply shows the tarsal and metatarsal bones. Except very rarely these growths do not occur upon any but the long bones.

The third picture shows a growth on the anterior surface of the tibia. You will note a very thin (faint) shadow, because the mass on the shaft of the tibia was almost entirely cartilaginous. This growth seems to be widely separated from the epiphysis; contrary to what might be expected from the literature of the subject. Above the articular surface of the fibula is another growth, and a similar mass was present in the mother. You will notice masses on both tibiae at the upper as well as the lower articular surfaces.

The fourth picture of the boy shows a characteristic "bowing" of both the fibula and tibia. There was also quite a perceptible bow-

ing of both the radius and the ulna. The appearance of the femur in the boy was similar to that of the mother in that irregular bony masses were noted about the head of the femur on both sides, i.e., the greater tuberosities were abnormal in their general characteristics. The flat bones for the most part were normal in appearance.

The fifth picture is of the boy. Note the anomalous appearance of the articular surfaces of both radii. Those of us who knew the boy were impressed with the peculiar attitude he assumed in walking, the manner in which he held his hands—almost invariably turned outward—and this will account for it. However, there are some developmental defects in the plate. There are no bone cysts present as the picture would indicate.

For comparison we will show the sixth picture illustrating the mother's right wrist. Note the peculiar appearance of the articular surface of the radius, i.e. at the epiphysis there is an osteochondromatous growth. The long bones of the fingers present no abnormalities. However, a gentleman present here tonight, told me of a case in which he had found quite a number of these bony growths on the finger bones. Such instances must be quite rare.

I am sorry the seventh picture is not clearer. I obtained a duplicate of the plate but did not succeed in getting anything better. It shows the characteristic bowing of both radius and ulna which has already been mentioned. Usually only the radius shows such a deformity, but in this case there is a decided bowing of both bones. If the picture were clearer the tubercles of the radius would be found much exaggerated. At the articular end of the radius there are some cartilaginous growths.

The eighth picture shows quite a large growth on one of the boy's ribs, also a mass at the junction of the upper and middle third of the femur. Attention is again called to the fact that in the literature great stress is laid on the fact that these growths never spring from anywhere except near the epiphyseal line of the long bones. We have already shown several pictures where the growths sprang from the shafts of the bones.

The ninth picture is one of the mother. The right femur presents a growth situated a little below that of the boy. You will also note there is a large osteochondromatous mass on one of the mother's ribs. In neither case did the skull show any abnormalities.

DISCUSSION:

H. E. Tuley: If I remember correctly these growths first began to make their appearance when the boy was about two years of age. As

he increased in age the deformity became more marked. During the two or three years since I saw him the growths have become much larger and the deformity has greatly increased. It has been surprising, however, the amount of work he was able to do. He has been in the army, was in France, and was very active in one of the clerical departments, and told me he was not on the sick list while away. During the last year the growths have increased in size and have become more deforming and incapacitating, and I am delighted to know that removal of some of the growths near the joints has given him increased function.

SYPHILIS*

By B. C. ROSE, Bryantsville.

Early diagnosis of primary syphilis is of the utmost importance. The psychological moment for treating syphilis is when the chancre appears. Vigorous and radical treatment at that time will assure the permanent disappearance of physical and serological symptoms in a far greater portion of cases than if treatment is instituted a few days later. Delay in beginning treatment often makes radical cure impossible.

Diagnosis: In making differential diagnosis of beginning syphilis, stress should be laid on: First, a history of exposure; second, the character of the sore.

A history of exposure: The incubation period of chancre is two to six weeks, of chancre, one to seven days; herpes genitalis occurs without relation to exposure.

The character of the sore: A chancre is usually, though not always, single, and may be located anywhere on the genitalia, on the lips, the tongue, or elsewhere. It is an erosion (which by mixed infection may become an ulcer) regular in outline, set upon an "induration" which projects beyond its base into the surrounding tissues. It is not painful and does not spread. It is often a very insignificant looking lesion, though the typical Hunterian chancre is very large sore. However, no matter what its size, its distinguishing characteristic is that it is an ulcerated tumor.

Chancroid occurs most often in the coronal sulcus close to the frenum, and is frequently multiple. It is a dirty ulcer, discharging large amounts of pus, with undermined edges, spreading rapidly, and painful. It is always soft and does not present induration unless it has been cankerized or unless it has been rubbed for some time against the patient's

clothes, when induration may be considerable. No sore should be cankerized until diagnosis has been made.

Mixed sores: The great majority of venereal sores are syphilitic. If the chancreoid and syphilitic infection occur together, the sore looks like the chancreoid, though the spirochete can often be demonstrated in its secretion, no matter how typically chancreoid it may appear to be. Mixed infection must therefore be kept in mind.

Herpes genitalis: Is an infrequent source of confusion. The lesions are small, non-ulcerated unless inflamed, not indurated, not painful and spreading.

Balanitis gangrenosa: Is rare. It begins as small whitish patches of superficial ulceration, spreading rapidly, discharges offensive brownish pus and unless treated, quickly becomes gangrenous. As in chancreoid a mixed infection with syphilis may also occur.

Diagnosis: Advanced syphilis is found in fifteen to thirty per cent of all patients examined who complain of persistent disturbances of one or more of the six great systems—namely, the circulatory, the respiratory, the alimentary, the osseous, the genito-urinary and the nervous.

The circulatory: Aortitis, aortic valvular incompetency, stenosis, aneurysm, syphilitic degeneration of the heart and blood vessels.

The respiratory: Lesions are sometimes found in the lungs, due to syphilis and somewhat characteristic of tuberculosis. Chronic inflammations of the nose and throat or upper air passages with more or less purulent discharges can be traced to syphilitic infection in many instances.

The alimentary: Gummata of the liver with disturbance of the gall bladder and digestion, splenic enlargement is in many instances due to syphilis.

The osseous: Syphilitic involvement of the joints, vertebra and bony system will produce many symptoms characteristic of tuberculosis.

Nervous system: General paralysis or locomotor ataxia, pupil irregularity, ophthalmoplegia, bladder disturbance, rheumatism, etc., aphasia, anesthesia and paresthesia, convulsions, gummatus meningitis.

Diagnosis: The finding of the spirocheta pallida by means of dark field microscopic examination, of course, is positive evidence of syphilis when this method of diagnosis is available, but even then care should be taken not to confuse the spirochete of syphilis with the spirocheta refringens, the latter being obviously coarser, the turns fewer and less regular. The spirocheta dentium seen in the

*Read before the Garrard County Medical Society.

mouth is much more minute than the spirocheta pallida. Negative findings by dark field methods do not necessarily mean that the patient is not infected with syphilis and where this method of diagnosis is available continued examinations should be made. Likewise a negative Wassermann does not mean the absence of specific infection and should also be repeated at least every two weeks or a month must pass before there is much probability of getting a positive Wassermann.

GENERAL PHYSICAL EXAMINATION

Once a positive diagnosis is made preparations for treatment should be at once instituted:

- (1) Careful general physical examination, paying particular attention to,
 - (a) The mouth, bad teeth, pyrrhoea, mucous patches.
 - (b) The eyes, iritis, keratitis, pupillary reflexes.
 - (c) The central nervous system, knee jerks, ankle jerks, Romberg sign, history of headache, vertigo, etc.
 - (d) The cardio-vascular system, myocarditis, endocarditis, arteriosclerosis.
 - (e) The skin, eruption, pigmentations.
 - (f) The anus, mucous patches, condylomata.
- (2.) Complete urinalysis should be made and albumen especially should be looked for.
- (3.) Blood should be taken for Wassermann and sent to the nearest laboratory.
- (4.) If the physician intends to use mercury by the inunction method, the patient should first be sent to the dentist to have his teeth put in good condition. The dentist should be told that the patient has syphilis.

TREATMENT:

Opinions as to the exact method in the treatment of syphilis vary greatly. Most all of us agree that the patient should have at least three administrations of arsphenamine together with mixed treatment while other advocate a more drastic course. Hugh Young's (of Hopkins) treatment briefly stated is as follows:

- A. As soon as a positive diagnosis has been made from the smears (but not before)
 1. Begin local treatment with calomel ointment (30%) rubbed well into the sore by the patient himself for at least ten minutes twice a day. This is very important. As Harri-

son puts it, the patient should "try to rub the sore away."

2. Keep the sore clean, free from crusts, and dressed with gauze smeared with calomel ointment.
- B. At the end of one week's intravenous treatment two doses of neosalvarsan and four or five of cyanide or salicylate of mercury—that is on the seventh or eighth day of the treatment.
 1. Circumcise the patient providing the chancre is on the prepuce and its location favorable.
 2. If circumcision is impracticable, either because of the condition of the patient, continue treatment with calomel ointment as above for at least one more week.

The outline for the administration of neoarsphenamine by Young is to give three-tenths of a gram intravenously every five days until four have been given. Every second day give one 1-100 of a gram of cyanide of mercury hypodermically. The first injection of arsphenamine may be three-tenths of a gram, the second four and one-half tenths, the third six-tenths, the fourth seven and one-half tenths, the fifth nine-tenths and here the treatment is discontinued for a month. The cyanide of mercury is often given with grey oil alternately. The above is what he calls the First Course. The first month he gives five and seventh-tenths grams of neoarsphenamine, eleven-hundredths grams cyanide of mercury and four-tenths of grey oil.

During his second course (tenth week) the patient receives three and six-tenths grams of neoarsphenamine and five-tenths grams of grey oil. Patient rests one and a half months and the third course is begun. This is the seventh month and is the same as the second course. Patient rests three months.

The fourth course: (Eleventh month) is the same as the second, i.e., neoarsphenamine and grey oil once a week and rest again for a month. At the beginning of each course a Wassermann is taken but regardless of the findings the treatment is continued.

Second year of treatment:

Rest for three months, and at the end of this period, do a Wassermann on the blood and make a complete serological examination of the spinal fluid obtained by lumbar puncture. If both blood and spinal fluid are negative, given no treatment. If either or both are positive, begin treatment again with course number two, i.e., neoarsphenamine and grey oil once a week. Dose of grey oil being one-tenth of a gram.

Four months later make a Wassermann on

the blood and if negative give no treatment. If positive, treat with course number two.

Months nineteen and twenty-four, or end of the second year: Make a Wassermann on blood and lumbar puncture with complete serological examination. If both are negative give no further treatment. If either or both are positive, begin again with course number two, i.e., neoarsphenamine and grey oil once a week. This process is to be repeated until spinal fluid and blood are negative at which time the patient is discharged as cured.

There are few conditions contraindicating the use of arsenic which should be borne in mind. They are:

First, myocarditis; second, advanced non-syphilitic or hepatic disease; third, Addison's disease; fourth, advanced arterio-sclerosis; fifth, advanced disease of the central nervous system; sixth, advanced pulmonary tuberculosis with cavity formation.

Certain types of syphilis require the cautious use of arsenic. They are:

A. Visceral disease of syphilitic origin, such as that involving the liver, lung, heart, and arteries. These must be treated with arsenic but the dose must be small to begin, two-tenths of a gram, and subsequent doses increased with care. No increase of more than two-tenths of a gram over the preceding dose should be given and should untoward effects or symptoms arise from any dose the next one should be the same or less.

B. The most frequent important relative contraindication to arsenic is the presence of kidney lesion, and for this reason it is highly necessary to examine the urine for albumin. This should be done before any treatment is given, and every two weeks during the treatment of mixed arsenical and mercurial treatment and every month when mercurial treatment is given alone.

GENERAL REACTIONS FOLLOWING ARSENICAL ADMINISTRATION:

Infiltration and thrombosis are caused by poor technique. General reactions are rare and only once in thousands of case do very severe reactions occur, provided the patient's intestinal tract is empty. Some of the reactions that may occur are, vaso-motor symptoms such as puffiness of the face, dilatation of the pupils, sense of constriction of the throat, precordial distress, and edema of the glottis, infrequently extreme and ending in death; syncope, the patient becomes faint during injection; peculiar taste in mouth, suggesting ether, chloroform, or garlic. The above are some of the reactions that may come on immediately, while other reactions that may follow by a few hours are: Rigor, rise of tem-

perature to 101- 104 F.; vomiting, diarrhea with pains in back and legs; urticaria; herpes labialis or herpes zoster. At various times from a day or two to a month or two after a single injection or course of injections the following may be noticed: Albuminuria, with or without casts; headache; lassitude or loss of weight, appetite and sleep; erythema, and dermatitis; jaundice and finally severe symptoms with headache, followed by mental confusion, coma and death. Autopsies show capillaries blocked with thrombi in the brain, kidneys and sometimes in the liver.

THE SIGNIFICANCE OF ACIDOSIS IN CHILDREN.*

By T. M. MARKS, Lexington.

Acidosis is something we hear lots about, are continually confronted with and find but little in the literature. This paper is not original but my conception of the condition from what I have read and from the cases I have seen.

Acidosis means a diminution of the alkali reserve of the blood. Any condition, therefore capable of bringing this about can produce acidosis. The possibilities are three in number;

1. Abnormal loss of alkali from the blood in ratio to the alkali absorbed from the blood.

2. Abnormal acids or abnormal quantities of normal acids are formed which neutralize the alkali of the blood. This form of acidosis occurs in diabetes mellitus, so called eyelie or recurrent vomiting and at times in ileo colitis. The metabolism of fat is incomplete and oxybutyric acid and diacetic are unoxidated.

3. Prevention of excretion of acid normally formed in metabolism cause a diminution of the alkali reserve of the blood. This is a true acidosis due in most cases to retention of phosphates. Seen in nephritis and also the acidosis of acute diarrhoeas.

For type 1, there is only theoretical proof that the alkali reserve of the body is lowered due to the loss of alkali by profuse diarrhoea. So in this discussion types 2 and 3 only will be discussed.

In type 2, acetone bodies commonly occur in the urine of sick infants and children but their occurrence is generally without clinical importance. It was at one time taken for granted that acetoneuria was synonymous with acidosis and the degree of acidosis present measured by the amount of acetoneuria. Howland and Marriott in 1916 showed that it required a considerable quantity of acetone,

*Read before the Kentucky State Medical Association, Lexington, September 27, 28, 29, 30, 1920.

diacetic and oxybutyric acids to impoverish the blood alkali reserve and with this as a criterion the increased production, or diminished oxidation of acetone bodies which commonly occurs in children is without clinical importance.

The nitroprusside test used for acetone detection is an extremely delicate one and has led to many errors, as the small amounts of acetone excreted in many diseases (fever, starvation) has led to the assumption that acidosis was present. Another feature which has tended to exaggerate the importance of acetone body productions is the fact that in the partial starvation of many obscure infections considerable amounts of acetone may appear in the urine receiving unwarranted attention, while the actual cause of the illness goes undetected.

There are, however, a few conditions not uncommon in young children which are accompanied by sufficient amounts of acetone bodies to cause definite acidosis. These are 1st, diabetes mellitus which while always complicated with acidosis in children does not come within the scope of this paper; 2nd, there is a type of severe toxic disturbance of children and infants manifested by from a mild to severe and fatal acetone body acidosis.

The children, generally between the ages of from four to nine years, are suddenly taken with rise in temperature, loss of appetite, complain of no definite symptoms except generally of pain upon swallowing, at first they seem listless then gradually become at times somnolent and at others very irritable.

Physical examination shows nothing besides moderately congested pharynx and tonsils, the child becomes progressively worse and begins to vomit but in no way suggestive of cyclic vomiting. The leucocyte count is between 15,000 and 25,000 and the urine shows large amounts of acetone bodies—at this time the child shows moderate hyperpnea and other definite signs of acidosis. It seems probable that the increased acetone body production is not the cause of this condition but merely an expression of the toxemia.

There is a tendency for such conditions to occur in families. Pharyngeal congestion is constant and in all cases leucocytosis, suggesting two possibilities. (1) that the condition is due to an infection; (2) that there is family predisposition to this type of metabolic disturbance.

In ileocolitis there may be a very marked increase in acetone body formation and many cases of acidosis have been reported as immediately preceding measles. There seems reason to believe that the underlying toxemia

in these attacks of obscure acetone body acidosis and that responsible for cyclic vomiting are of similar nature. In many cases of acetone body acidosis vomiting occurs, although it is not as severe nor as prolonged as in cyclic vomiting in some instances the same child will have at one time an attack of cyclic vomiting and at another time an acetone body acidosis without severe vomiting. Schloss of Bellevue has recently reported two cases of this kind.

In cyclic vomiting you have distinct acetonuria but it is late and there is, if any, only a mild degree of acidosis, the acetonuria being caused by starvation.

The severity of the illness in acetone body acidosis varies greatly, from the exceedingly mild and sudden temperature as high as 105, abdominal pain, vomit once, listless, sore throat, large quantities of acetone and diacetic acid in the urine; a couple of bowel irrigations with normal saline, cut out fat and the next day the temperature is normal and no further disturbance, to the case of the fulminating type and of such severity as to cause death in twenty-four hours despite the most vigorous treatment.

It is interesting to note that Schloss' two reported cases subject to both cyclic vomiting and to acetone body acidosis, always develop pharyngitis and tonsilitis at time of attack and upon removal of tonsils there was a cessation of attacks. Sedgwick has observed that cyclic vomiting attacks have stopped in children whose adenoids has been removed, giving the probability of the adenoid harboring the causative agent.

The treatment of acetone body acidosis is unsatisfactory as little is known of the cause except that fat metabolism is deranged. Abundant water should be given and if refused by mouth, given as normal saline by rectum or if necessity requires subcutaneously or intra peritoneally. In all cases fat should be reduced to zero and in the severe cases brown sugar or glucose given as retention enemas at three hour intervals until all signs have disappeared. Brown sugar is more desirable as it apparently is more easily assimilated.

The consensus of present day opinion is against the giving of alkali—at any rate alkali should never be given over a long length of time, nor as a prophylactic against another attack as a high alkali reserve is hardly more desirable than a slightly low one. The severest case of this type of acidosis that I have seen was in a child ten months old who vomited his six o'clock feeding and without further warning went into coma, two hours later he was given 120 c.c. of four percent glucose

in normal saline by way of longitudinal sinus—at the time of the glucose administration the CO_2 tension of the alveolar air was 16, four hours later he was out of coma, alveolar tension 25 and the next morning was playing in bed and two days later this child developed chicken pox.

The production of acetone bodies in these conditions, may be due to a diminished destruction of the bodies normally formed, to an increased production of these bodies or a combination of both, probably the effect of some toxic agent on metabolism. Fever and leucocytosis are always present and frequently mild tonsillitis and pharyngitis, there is a tendency to recur and for children in the same family to be affected. Whether or not there is any relation to these obscure conditions and cyclic vomiting is still a matter of discussion.

Type 2 also contains the post operative acidosis so frequent in children subjected to a general lipogenic anesthesia, in some cases making heroic measures necessary for recovery. These children are given a light supper the night before followed with catharsis and no breakfast the following morning, an enema if the operation is abdominal. This, combined with a general anesthesia and complete starvation for that day may bring about a severe acetone acidosis.

The operation does not necessarily have to be long, requiring long anesthesia, but certain types of children with a tendency to acetone formation will have a moderately severe acidosis following the quick removal of tonsils and adenoids. It is advisable to give these children their usual supper and a glass of milk or tea and crackers for breakfast preceding the operation, it is far better that the child vomit than to have acidosis, furthermore it has been conclusively shown that the coagulation time of the blood is materially increased one to three minutes or more above normal in cases showing a marked degree of acetoneuria—hence the tendency of these cases to bleed.

NON-ACETONE BODY ACIDOSIS.

Type 3 is most commonly associated with acute intestinal disorders in infants and is the type we most often see, without apparent cause these infants start up a severe diarrhoea, eight to twelve green stools a day and vomit after each feeding—at the beginning they are very irritable and restless, facial expression anxious, eyes rapidly become sunken and loss of weight as high as a pound a day. For a time the infant will lie quite still, eyes half open, whites showing, suddenly become restless and cry out shrilly.

Physical examination shows nothing of sig-

nificance, the temperature is rarely high, skin inelastic due to loss of body fluid. You must rely upon your observation and laboratory data. The type of breathing is by itself diagnostic, respiration 36 to 44 per minute with inspiration deep, labored and prolonged, no cyanosis present, indicating a moderate degree of air hunger, better expressed as hyperpnea.

The laboratory will show a high red cell and white cell count and high hemoglobin, because of the increased corpuscular volume due to the loss of water in the stools. The CO_2 tension of the alveolar air is direct check upon the degree of acidosis present and will be around 25 or lower, the greater the air hunger the lower the CO_2 tension. The CO_2 tension for normal infants and young children is 35. The urine will show albumen and possibly casts.

A picture of severe toxemia due to poisonous products manufactured by bacteria in the intestine or to products of abnormal metabolism. Howland and Marriott were the first to show that these patients have acidosis of the non-acetone body type, acetone may be present in small amounts but in this instance has no clinical bearing on the case. Hyperpnea without cyanosis and the nervous symptoms are the only bedside signs and the cause can only be acidosis.

The estimation of blood acidity can only be accurately determined in terms of H—ion concentration, a decrease in blood alkalinity is evidenced by an increase in the H—ion concentration, it is out of the question for the practitioner to do this calculation even if he had the available laboratory at hand. But the CO_2 tension of the alveolar air is easily determined by the method devised by Marriott and apparatus simple, consisting of color scale, rubber bulb, football bladder and standard sodium bicarbonate solution. A piece of thin rubber large enough to cover the child's face is attached to a large bottle nipple, the bag blown up with the bulb, pinched off attached to the nipple which is in turn held over the child's face, the rubber on the stretch to keep the air from escaping, the child then empties and fills the bag four times. The alveolar air collected is then passed through a test tube of the standard sodium bicarbonate solution and matched upon color scale, 35 being normal for an infant.

When hyperpnea is present without cyanosis the alveolar air CO_2 tension is not really needed for diagnosis but acidosis may be present in a mild degree without noticeable hyperpnea in which case you are able to discover and prevent by the Marriott method.

This type of acidosis, a true acidosis, is still

but a symptom and though after effective treatment it has cleared up you still have the intestinal intoxication to deal with, this correction gives the child its only chance of recovery.

In these cases prompt means must be taken to check the loss of fluid from the system. Initial purgation is dangerous unless character of stools, fever and tympanites shows that irritating substances still remain, astringents and opium should be used at once and in contra distinction to acetone body acidosis alkali should be given to increase the lowered alkali reserve. The alkali of choice is sodium bicarbonate given in approximately three per cent solution with normal saline, if given intravenously, or subcutaneously great care must be taken in preparing your solution, for if you add sodium bicarbonate to normal saline and sterilized by heat sodium carbonate is formed which is extremely irritating, causes some shock if given intravenously, sloughing if given subcutaneously.

A freshly opened tin of Squibbs' sodium bicarbonate is generally sterile, add the required amount of sterile normal saline, heat to body temperature and culture or better test out your sodium bicarbonate for organisms and keep a sterile tin on hand for emergency use.

Along with this treatment hypodermoclysis of normal saline may be given or an intraperitoneal injection if the body dehydration should call for more rapid measures, for the early case high colonics of the bicarbonate solution generally suffice.

The above described type includes the fourth class of Finkelstein's classification—alimentary intoxication, probable cause being the administration of food much above the tolerance of the child and consequently you have severe metabolic disturbance. The disorder is acidosis, termed by some as acute milk poisoning, clearly a case of faulty metabolism since in favorable cases if all food is taken away for twenty-four hours the symptoms cease or become much less severe.

The symptoms have already been described to some extent—the earliest is fever, moderate or high, generally accompanied by diarrhoea, rapid loss of weight and frequently vomiting. In the severe case there is great prostration, restlessness, lassitude, delirium, coma, even convulsions, sunken eyes, shriveled skin, pinched features, albuminuria with casts, hyperpnea with prolonged inspiration, a high degree of leucocytosis and in some instances cough. The principal characteristic being the predominance of the nervous and other (hyperpnea) symptoms of acidosis seen from the beginning. The degree of diarrhoea and vom-

iting by no means accountable for the severity of the condition.

CONCLUSIONS

1. Acetonuria does not necessarily mean acetone body acidosis.
2. True acidosis, the most common type in children, shows no acetonuria in the early stages, and never enough to be of clinical importance.
3. Hyperpnea with nervous symptoms and no cyanosis in an infant means acidosis.
4. That acidosis is the most common disorder to be overlooked in treatment of children, many deaths resulting because many still claim that if there is no acetonuria there is no acidosis.
5. It is deemed inadvisable to treat acetone body acidosis with alkalies while in true acidosis alkali is indicated.
6. That acidosis introduces the necessity for rapid and energetic specialized treatment but when it is overcome, the underlying condition is still to be recognized and combated.

DISCUSSION:

W. F. Boggress, Louisville: I have enjoyed this paper of Dr. Marks very much indeed, and I think that we have listened to one of many most excellent and practical papers that have been read. The question of acidosis is one that until recently we had not clearly understood or recognized in children. I think many of our deaths from serious diseases in children are not due to the underlying infection or primary infection, but are due to the condition of acidosis caused by this infection. There is no condition as frequent in the early years of life I think as acidosis. Dr. Marks has given us in his splendid way the different types, the one with acetonuria, and the one without acetonuria. You cannot always determine the amount or variety of the acidosis by simply determining the amount of acetone bodies in the urine. In any wasting diseases, in any diseases of starvation, in any severe infection, you have a disturbance of your alkali equilibrium. You have a rapid elimination of your alkalies. Take your exophthalmic goiters, where the alkalies particularly or calcium salts are more rapidly eliminated than in any other known disease, and I think disturbance of your alkali equilibrium in your exophthalmic goiter is one of the most distressing and dangerous conditions you have to deal with. As to the administration of sodium bicarbonate, it is an excellent alkali, which we all use, but in an acidosis case it alone is not sufficient. You must consider also disturbance of the calcium equilibrium, and your calcium salts are indicated. Your glucose is another thing you overlook. We used to be afraid of sugar in

the urine; we were afraid of the administration of sugar to a young child. It is necessary to use a certain amount of it for the development of childhood. It is an excellent carbohydrate; it is an excellent thing to prevent and overcome acidosis, and in your postsurgical acidosis, resulting from your diseased condition plus surgical shock, plus your anesthetic, your glucose is one of the greatest safeguards you have in overcoming your acidosis and in saving the patient's life. How many patients postsurgical have you saved with not only the administration of alkali but glucose intravenously or by proctoelysis? If this paper does nothing else but to call our attention to the frequency of acidosis in children, to the severity of acidosis in children, to the frequent complications of what would be simple diseases and diseases that are not dangerous, if it were not for the occurrence of the acetone poisoning in the blood, its author has accomplished a good deal. If there is nothing else but just calling attention to these facts the paper has been excellently presented by a scientific reader.

John W. Scott, Lexington: It seems to me, the point brought out by the essayist should be very strongly emphasized, namely, that in diagnosis one should not depend upon the finding of acetone bodies in the urine. It has been a very common mistake of profession, that of believing that the absence of acetone in the urine indicates freedom from acidosis. As the essayist has said the presence of hyperpnea and nervous symptoms alone is sufficient for diagnosis or at least, bears a strong suspicion of acetone body acidosis. The hyperpnea, that is, exaggerated breathing, without dyspnea, is very striking and very suggestive of this condition. The estimation of the carbon dioxide in the alveolar air is, however, the deciding factor in the diagnosis of acetone body acidosis.

As the essayist has said, the treatment of this condition by sodium bicarbonate and other alkalis is entirely discredited. It does not maintain the alkali reserve, but tends to diminish it. The exclusion of fats, which cause an increase in the oxybutyric acid and other acetone bodies, is a very important factor in the treatment. Of course, where such an acidosis occurs, the absolute withdrawal of fat in every form is of the utmost importance in the treatment of children just as it is in the acidosis of diabetes which is an acetone body acidosis.

P. C. Layne, Ashland: I should like to ask any of the members whether they have had any experience with the methyl red test for acidosis? It is quite difficult for the average practitioner to make the usual tests for acetone bodies in the urine, and any test that will simplify matters and yet prove accurate is to be greatly welcomed. In the latest edition of *Saunders Encyclopedia of Practical Medicine*, Vol.

ix., p. 37, is given a very simple test which is said to be reliable. The test is directed to be performed in this manner: Dip clean filter paper into the urine to be tested, and upon the wetted area place one drop of methyl-red. If acid to this indicator the spot will turn red and if alkaline, canary yellow.

Normal urine will not react red to this solution, except before breakfast. Only urine containing ten times too much acid will react. If the urine is acid to methyl-red, one may drop a drop of paranito-phenol on another piece of filter paper wet with the urine. If no change of color takes place the urine is exceedingly, even dangerously acid; if on the other hand the urine is alkaline to this indicator, a greenish yellow color will appear.

This test is so simple and so unqualifiedly recommended by the editors of the above publication, that it should be familiar to every one.

T. M. Marks, (closing the discussion): I tried to bring out in my paper the inadvisability of depending upon the urine for the degree of acidosis.

I am not familiar with the test Dr. Layne spoke of. All you have to do is to add one crystal of nitro-prusside to a 5 c.c. of urine in a test tube shake it up; add one drop of sodium hydroxid and hold up the test tube; the alkali will change the color of the urine to red. Add a drop of glacial acetic acid and let it down in the tube, if it leaves a purple path you have acetone. It is not the best test, but a simple one, and any one can make it. But the presence of acetone in the urine gives you no idea of the degree of acidosis, the only check on the degree of acidosis in these cases is with the CO_2 combining power of the blood. As this test is not practical for the general practitioner, you have a test devised by Marriott, which I will read from my paper.

Capillaroscopy.—M. Weiss analyzes recent works on the capillary circulation and its significance. As the respiratory movements, by the vacuum which they induce in the lungs, attract the capillary blood into the right auricle, they accelerate the circulation in the veins throughout. E. Weiss does not hesitate to say that nephritis from chill and scarlatinal nephritis seem to be manifestations of a general disease of the capillary apparatus. He even defines scarlet fever as a generalized capillaritis. It affects the skin and the kidneys. Heart disease modifies even the capillary circulation. With congenital cyanosis and complicating bone and joint disease, the venous portion of the capillary loops is engorged. This suggests that disturbance in the peripheral circulation may have something to do with the pathogenesis of joint disease.

FOREIGN BODY REMOVED FROM THE NASO-PHARYNX.*

By JAMES ROYDEN PEABODY, Louisville.

The specimen which I exhibit is a foreign body which was removed from the naso-pharynx. The patient was a female aged twenty-five years, married, the mother of two children, who came to the Louisville city hospital clinic two weeks ago complaining of sore throat. There was nothing about her symptoms or her appearance to indicate anything unusual, and we first thought she had an ordinary sore throat; but on getting closer to her I noticed a very foul odor of her breath which suggested atrophic rhinitis or ozena.

Examination showed the throat somewhat reddened, the pharynx looked red, but there was no tonsillar involvement. The anterior nares were then examined and nothing abnormal found. The next step was examination of the naso-pharynx. I found the posterior naris on the left side filled with a rather large mass, grayish in appearance, which I thought was either a sequestrum or some foreign body which had lodged there.

In the absence of any history that a foreign body had been introduced into the nose I thought it must be a sequestrum. I considered the question of syphilis, although I had never seen anything of the kind which could be attributed to a syphilitic origin. She gave no history to cause one to think it was syphilis, and I then concluded it was a foreign body of unknown origin and should be removed.

The patient was questioned closely about her previous personal history, and it developed that the day before Thanksgiving she became ill while in Cincinnati and was taken to the hospital. She said she had a rapid pulse and high fever, and twelve hours after being admitted her nose had been operated upon, the nature of the operation she did not know, but she said some doctor did an operation under local anesthesia and told her a piece of bone had been removed from her nose.

From this history it seemed probable that the middle turbinate had been removed by the same operation and eluding the operator had gravitated into the naso-pharynx, an accident which has happened many times. The usual procedure is that the severed turbinate bone recedes into the pharynx and is later expectorated by the patient.

It seemed certain that in this case the piece of bone had become impacted in the naso-pharynx. I had an instrument or forceps

with which to seize the mass, so I cocaineized the anterior naris and also the uvula and throat, then with a curved probe wrapped with cotton the foreign body was gradually loosened and finally removed through the mouth. The piece of bone was covered with foul smelling exudate, and after it was removed the patient expectorated a considerable quantity of odorous material.

The interesting features in this case are: First, it shows that accidents of this kind sometimes happen. Second, that the patient had no symptoms until about six weeks after the turbinate bone had lodged in the naso-pharynx. Third, that the only symptom the patient then gave was sore throat which began about two weeks before she entered the hospital, although her attention had previously been called to the fact that her breath was very offensive.

I thought the case of sufficient interest to warrant its being recorded.

DISCUSSION:

S. G. Dabney: Dr. Peabody's description of the location of the foreign body in the case reported I believe should be changed slightly. He reported the case as the removal of a foreign body from the naso-pharynx; this was a foreign body in the posterior naris. A foreign body of this size would gravitate downward from the naso-pharynx. I think it would be difficult for a foreign body to lodge in the naso-pharynx unless unusually large in size. I have never seen a similar case.

I have seen many foreign bodies in the nose, some of them were located far backward in the nasal cavity and remained there for long periods before being removed. We all know that children quite frequently introduce foreign bodies such as beans, peas, buttons, etc., into the nose and removal is sometimes difficult.

I have seen but one case where a foreign body projected from the nose into the naso-pharynx, and that was a rather amusing one. A young man was in the habit of performing a trick for the amusement of smaller boys, by which he would take a wire and introduce it into his nose, and he had another wire fastened to his collar, and he would demonstrate how the wire could be pushed through one side of his nose and pulled out at the back of his head. On one occasion he pushed the wire into his nose and could not get it out. He went to see a doctor who was foolish enough to try to remove the foreign body without seeing it or using a head mirror, and in this way pushed the wire further backward into the nose and it lodged in the naso-pharynx. When the patient was brought to me I managed to remove the foreign body by push-

*Clinical report with exhibition of specimen before the Louisville Medico-Chirurgical Society.

ing it backward into the naso-pharynx with my finger.

That was a case where the foreign body was in the naso-pharynx, but it also projected into the nose. While accidents of the character mentioned by Dr. Peabody are infrequent, they are liable to happen to anybody.

I. A. Lederman: From the history detailed by Dr. Peabody the presumption is reasonable that this was the middle turbinate bone which had been severed by means of a snare and slipping away from the operator had lodged in the posterior naris. The specimen represents more than one-half of the anterior portion of the middle turbinate. Such accidents are not so very unusual. I can recall one instance when I lost the middle turbinate after the use of a snare.

I remember some years ago seeing a patient who had been operated upon by the late Dr. Ballinger. The patient came to me with an obstructed nostril and considerable inflammatory reaction about the naris, and upon looking into the nose, after shrinking the tissues with cocaine and adrenalin, I saw what appeared to be a spicule of bone protruding from the middle meatus. This was grasped with forceps, easily removed, and proved to be part of a larger mass of bone.

The history was then obtained that about three weeks before Dr. Ballinger had removed the middle turbinate. Subsequent events showed that he had separated the bone but had not removed it.

J. R. Peabody, (closing): I agree with Dr. Lederman that accidents of the kind I have related happen occasionally. I have always made it a rule to not leave the patient until I was certain all the turbinate had been removed.

To show that others have recognized the importance of preventing such accidents, special instruments have been devised for removing the middle turbinate bone. Some operators even go so far as to pass a suture through the anterior portion of the turbinate before the bone is finally severed.

The patient I have mentioned had no discharge from the anterior naris. She told me afterward that she could not breathe through that side of the nose.

Another feature I did not mention is that blood was taken for a Wassermann test before I recognized what the trouble was and before the mass was dislodged. The specimen having already been secured the Wassermann was made as a matter of routine with negative result.

The nasal passage was thoroughly cleansed and in three or four days the patient was so much relieved that she did not return for further observation.

In this connection I wish to mention another case reported in the *Journal of the American Medical Association* where the foreign body in

the naso-pharynx consisted of a large mass of chewing gum which had remained there for several months. The patient was a boy who complained chiefly of inability to breathe through his nose. The trouble was thought to be due to adenoids and operation was proposed. A general anesthetic was administered and examination of the naso-pharynx revealed the presence of a large mass of chewing gum which was easily removed. The mass had remained in the naso-pharynx for a long time and was covered with a foul-smelling exudate.

SYPHILIS OF THE RECTUM.*

By GRANVILLE S. HAYNES, Louisville.

When I read a paper before this society about a year ago I showed a patient who came to me about twelve months previously and who was supposed to have had cancer of the rectum. We decided at once that he did not have cancer, but were unable to determine the character of the disease. We simply treated the case clinically by employing various kinds of irrigations which were ineffective.

After having treated the patient perhaps for three months, one day in conversation I asked him if he had ever had syphilis, and he said that he had thirty years before and that he had been treated by an eminent syphilologist of this city and was considered cured.

I had blood and spinal fluid Wassermanns made and both were negative. Notwithstanding these findings I sent the patient to a syphilologist who gave him arsphenamin at weekly intervals by intravenous injection. Within five weeks I could see a decided improvement in the patient's condition. He is now absolutely well, at least there is no local disease in the rectum. He returns every three or four weeks for an injection of neoarsphenamin into the rectum; he has been doing this for the last six or seven months. He also takes protiodide of mercury for a month then rests a month. There is no question in my mind that this man had syphilis because he was cured by antisyphilitic treatment.

One day last December there appeared in my office two patients, strangers, one from Evansville, Indiana, and the other from Owensboro, Kentucky, the latter being a woman. I examined these patients and found they had lesions involving the upper part of the rectum and lower part of the sigmoid; these lesions were as much alike as I have

*Read before the Louisville Medico-Chirurgical Society.

ever seen in two clinical cases. I called Dr. Chas. Farmer in to see them. These lesions were very much like the one that appeared in the case that I have reported. About two and one-half inches above the internal anal opening was the beginning of a constriction of the rectum. I could introduce only a small proctoscope through the lesion for a distance of about five inches. In each case there were six or eight small polypoid or excrecent growths. The man's rectum was not ulcerated but it was red and granular and the walls were fibrous and contracted producing stricture. He had been treated by a local surgeon for several months without improvement. A blood Wassermann had been made with negative findings. I also had a blood Wassermann made which was negative. A blood Wassermann was made in the case of the woman with a finding of three-plus.

I presumed these cases were both syphilitic and started out on that basis. I sent the woman home, as she could not remain here for treatment, and wrote a letter to the doctor who sent her to me giving him my opinion and advising him to use arsphenamin. I have no further report on this case except a letter from the doctor received today saying that he was using the arsphenamin treatment.

The man I kept in the hospital for two weeks. I had noticed a number of reports where arsphenamin or neoarsphenamin had been used per rectum, so thought I would try it in this case. I gave him 6-10 of a gram of neoarsphenamin per rectum every six days until six doses had been given, then advised him to take protiodide of mercury $\frac{1}{4}$ grain two or three times per day according to the effect upon his stomach. At the same time I advised him to take iodide of potassium. That was in December, 1920. The patient (the man) has returned every three weeks since; he was in my office last week. The disease so far as was manifest through the proctoscope has almost entirely disappeared. I can introduce a proctoscope almost twice the diameter of the one that was used at first. Four or five small polypi were removed by means of the little machine shown you at the time of my original report, that is by cauterization.

The man has gained ten or fifteen pounds he is now at his former weight, he is feeling well, he has no symptoms referable to the rectum, and I feel confident he will be entirely relieved.

I thought these cases might be of interest, and I believe the rectal method of introducing arsphenamin or neoarsphenamin is very effective in the treatment of such cases.

DISCUSSION:

W. J. Young: I have seen some of Dr. Hanes' work in the diagnosis of syphilis where the Wasserman was negative; in fact, he has sent a number of patients to the clinic with negative findings and we subsequently proved the existence of lues by the therapeutic test. I have been anxious to hear what he had to say in regard to these cases of which he has had quite a number.

As to the administration of arsphenamin per rectum: I have had no experience with this method, but do not see why it would be any more efficacious than when given intravenously. Of course we are assuming that the rectal strictures or tumors are luetic in origin, i. e., manifestations of syphilis, and by giving arsphenamin intravenously it seems to me a more direct effect would be secured than by using the rectal method.

Arsphenamin is not direct spirochaeticide; the theory is that it creates antibodies in the system which destroy the spirochaetes. Outside the body the only effect of placing spirochaetes in arsphenamin solution is to sterilize them. I cannot see any advantage of the local application of arsphenamin in the rectum hoping that enough would be absorbed to produce antibodies and thus destroy the spirochaetes.

It seems to me that the proper way to treat these cases would be to use arsphenamin just as we do where any other symptoms of syphilis are present, whether the lesion be about the eye, the nose, a gumma somewhere in the body, or a tumor in the rectum, and the most advantageous plan in my opinion is the intravenous route.

Owsley Grant: Dr. Hanes mentioned the spinal puncture in these cases. The results of the Wasserman reaction of the spinal fluid and the blood is very interesting and it has been observed so many times that the spinal fluid is positive when the blood is negative that any suspicious case of lues where the clinical symptoms are very suggestive, the examination of the blood alone should not be deemed sufficient where it is negative. So frequently is this the case that many of the foremost authorities consider that a definite strain of the spirochaetae may attack the nervous system and not involve the production of antibodies in the blood at all, and hence give the Wasserman only in the spinal fluid.

In regard to the treatment of syphilis by the local introduction of arsphenamin by the rectum: Much work in this line has already been done, but it is to be remembered that syphilis is a systemic disease, and not a local one, and syphilis of the rectum should be regarded as only one manifestation of a disease that is

current throughout the system, and hence be treated so. Injection of arsphenamin by the rectum, however, has a definite field, I believe, in the treatment of syphilis, and that route is especially adapted to the treatment of young children or older persons whose veins it is difficult to find. I have done some of this work with gratifying results. In young children I am in the habit of giving the drug in the rectum in a solution of oil, after having thoroughly emptied and cleansed the rectum. The drug given in this way shows some tendency to a cumulative action, as it is absorbed more slowly than through the vein, and care must be taken not to give such doses as will produce this effect. It is not the method of preference where the intravenous method can be used because the absolute dosage is less certain and the effect is not so rapid.

In speaking of the local effect of injections into the rectum, it must be remembered that this portion of the anatomy is not the only one to be cured and it must not be confused with the local treatment of "Trench Mouth" by neoarsphenamin, because although the latter disease shows a spirochaete it is not the same as the *treponema pallida* and does not produce the same systemic effect, and consequently is a disease of quite different order.

G. S. Hanes (closing): I think Dr. Young and Dr. Grant are laboring under some misapprehension about my giving arsphenamin by the rectum. It was not used for its local effect. I had read where a number of men had given arsphenamin per rectum and I was experimenting. I wanted to see from my own observation whether or not it was the best method. After having the experience that I have related I must say that I am very favorably impressed, because the progress of the improvement in these particular cases was as rapid as in the cases I reported last year to this society who had intravenous treatment.

In regard to the absorption of arsphenamin when given by the rectum: I dissolved 6-10 gram in four ounces of distilled water, then injected this quantity in solution into the rectum leaving the patient in position for ten or twenty minutes. He was then allowed to recline for half an hour or an hour before leaving the office. In this way there was no question about his retaining the solution. I noticed an article on this subject in the *Journal of the American Medical Association* a few weeks ago in which it was suggested there was no question but the solution was absorbed by the rectum. In the cases I have reported I think the drug was absorbed before the patient left the office.

I do not believe there can be any cumulative effect in introducing the agent in this way as suggested by Dr. Grant, certainly no more than

when given intravenously; in other words, it is absorbed within two or three hours, and I do not see why the agent should be cumulative in its effect; at any rate this method was used as an experiment.

As to the Wasserman reaction: In these old rectal cases which I have had in private practice, are in numerous cases which we had at the Louisville City Hospital last year, we did not get positive Wasserman findings in one-fifth of the cases where we had old rectal syphilis. In all of them we made a blood Wasserman and in a number of them we made both blood and spinal fluid Wassermans, and as I recall there were only two that gave positive spinal fluid Wasserman where we found the blood negative.

I am favorably impressed with the method of giving arsphenamin or neoarsphenamin by the rectum at the present time, and as Dr. Grant has stated it is certainly an advantageous plan of introducing the agent in young children and also in cases of rectal syphilis.

I hope later to make a further report along this line.

CASE OF MENINGITIS.*

By I. A. LEDERMANN, Louisville.

I would like to mention a case of meningitis occurring in a young woman who had chronic frontal and ethmoidal sinusitis and who had been operated upon both sides by exenteration of the cells, intranasally, and the Killian operation on both frontal sinuses. She had been apparently relieved for a long time, but she began suffering with intense headache and after a few days symptoms of meningitis developed. The symptoms were so mild in type that we waited a few days to determine whether there not some infection besides the sinuses. At that time the sinuses were apparently clear. Spinal puncture was made; examination of the fluid was at first negative; but later showed some increase in cell count and globulin content; no bacteria found.

We then decided to open the frontal sinus, which had been operated upon ten months previously, believing that she probably had a frontal lobe abscess with meningitis underneath it, but not a generalized meningitis. I opened the frontal sinus and found it apparently clear, there was a little roughened bone in the base of the sinus near the entrance to the nose, there was no pus and healing had occurred from the previous operation. We made quite a wide excision taking away the entire front wall of the sinus,

*Clinical report before the Louisville Medico-Chirurgical Society.

then removing the posterior wall exposing the dura of the frontal lobe, which was found normal. The frontal lobe was explored and nothing abnormal found. The patient appeared to be in good condition at the close of the operation, but while we were applying the dressing she suddenly ceased breathing and did not survive.

We were fortunate enough to secure permission to make an autopsy in this case. The most interesting feature was that we found the patient had meningitis confined to the cortex. It looked very much like a tuberculous meningitis. Both sinuses which had been operated upon had healed and there was no pathway into the brain.

The brain was sectioned and no abscess cavity found anywhere. The only lesion we could find, and we thought that was not really sufficient to cause the death of the patient, was a so-called vertical meningitis. A specimen of the exudate (lymph) was sent to the laboratory and examination showed it to be ordinary inflammatory lymph, not tuberculous in nature.

I am reporting this case because we thought it was a case of meningitis following sinus infection. This was clearly disproven by the autopsy. As to whether the nasal accessory sinuses had anything to do with the production of meningitis in this case we do not know. The cultures showed staphylococci but no other organisms. The case was mild in type and resembled tuberculous infection, in fact to look at the brain it appeared like a tuberculous meningitis.

The woman had no other lesions in the body and there was nothing else to account for the symptoms nor for her death.

DISCUSSION:

J. G. Sherrill: It is well known that an abscess of the brain may lie dormant for a long time, and I am impressed with the fact that the infection in this case may have entered at the time of the original lesion and before the first operation upon the sinuses, and perhaps the bacterial growth did not become virulent until later in the history of the case.

It is questionable whether infection can remain in the meninges for a long time and then become active, but we know that bacteria may lie in the central portion of the brain for a considerable period and then cause the development of abscess. I have wondered whether it is possible for infection to remain dormant in the meninges and then develop. This point is worthy of consideration where the line of infection cannot be traced.

S. G. Dabney: I think we all recognize the danger of extension of infection to the brain

from sinus disease. Such cases are always dangerous and we should remember this in operating upon the sinuses. We are getting very close to the headquarters of the brain when the frontal, sphenoid and ethmoid are opened.

I presume in the case reported by Dr. Lederman, extension of infection occurred along the sphenoid. It is not uncommon that no opening into the brain is found where infection extends from the sinuses.

ENCEPHALITIS; CASE REPORT.*

By WM. A. JENKINS, Louisville.

The subject of this report is W. J. B., a healthy looking country boy, aged twenty-five years, a student at the College of Pharmacy in Louisville. His family and past personal history negative. His father said the patient had never been regarded as very robust but he has had very little sickness.

Last Friday morning when he got out of bed he called to his roommate for assistance saying he was paralyzed. His left side seemed to be principally involved. The next instant, and before his roommate could assist him, he pitched forward apparently in a convulsion and became unconscious. He was brought to the hospital about three o'clock in the afternoon. His people were notified and he was still unconscious or at least partially so when his father arrived bringing his local physician with him. They telephoned me in the middle of the night and I came to the hospital to see the patient at that time.

Interne's history: "Patient brought into hospital unconscious, examination shows spastic paralysis left side; marked Babinski both feet; exaggerated reflexes especially on left side. Pupils equal in size and react sluggishly to light; slight convergent deviation of both eyes. His roommate stated that patient had not complained of being ill at any time so far as he knew. When he got up in the morning he complained of being weak, and when he started to put on his clothes said he was paralyzed, and an instant later fell forward on the floor. Patient has been unconscious ever since. Diagnosis: cerebral embolism."

Physical examination was made with the patient in a partially unconscious lethargic state. No examination could be made of the cranial nerves, but it was noted that there was internal strabismus and the conjunctival reflex was lost. The patient had not bitten his tongue and could be aroused. That was Saturday morning. By speaking close to his ear in asking him a question he was able to say yes

*Clinical Report before the Louisville Medico-Chirurgical Society.

or no, and when asked if he wanted a drink of water he would say yes and was able to drink when the glass was placed to his mouth.

Head and neck negative. Vegetative organs of chest and abdomen negative. Temperature 100 degrees F. a few hours after admission; 99 degrees F. the next day, pulse not much above normal rate. His major reflexes were slightly exaggerated everywhere. There was spasticity of the left side (hemiplegia) at first, which is not common in the ordinary cerebral hemorrhage. The spasticity apparently disappeared after the first few hours, but the examination was not altogether satisfactory for the reason already stated. His abdomen was not distended. Urinary sphincter incompetent, urine passed without his knowledge. Constipation marked and persistent. Abdomen flat and otherwise negative. Both knee jerks slightly exaggerated, Babinski both sides, slight ankle clonus left side. The left hand was semi-flexed. The usual laboratory procedures were begun at once.

The important question arises what was the matter with this man? Did he have an embolus as the interne thought; was it a hemorrhage, syphilis, or encephalitis? It is sometimes a difficult matter to differentiate between these conditions. When I saw him there was a peculiar twitching of the involuntary muscles of the body. The fact that his spastic hemiplegia had practically subsided, that his pupils were equal in size and reacted to light, that his conjunctiva was absolutely insensitive, that the condition was not coma but one of lethargy as the patient could always be aroused, caused me to suggest that it was probably a case of fulminating encephalitis, at the same time I remarked that I would feel safer about the diagnosis after a Wassermann test had been made of the blood and spinal fluid. These examinations were made with negative findings. A catheterized specimen of the urine was found to be negative.

The patient has gone along in about that condition ever since. His lethargy has continued but he can always be aroused. His temperature is slightly higher now than formerly. To-night at 6:30 it was 103.2 degrees F., pulse rate 118.

Now for the laboratory side: Wassermann examination of both blood and spinal fluid negative. First catheterized specimen of urine negative for casts and albumin, specific gravity 1020. No organisms found in spinal fluid. Blood culture negative. The urine for the last two days has shown some albumin and an occasional cast. Blood count: leucocytes 14,850 with normal differential. The blood chemistry shows nothing abnormal. I

think it is a plain case of epidemic encephalitis which apparently had a fulminating onset. This is the diagnosis I have made.

The eye grounds were examined on two different occasions; both eyes reported clear with normal fundus. There was some blood in the spinal fluid on the first two punctures, but the last specimen was clear.

I had the patient's father visit the boarding house and make inquiries concerning the onset of the illness, and the only information obtained from the boys with whom he was associated was to the effect that he had complained of nothing until the morning when paralysis developed as I have stated.

DISCUSSION:

W. E. Gardner: I saw this patient only once and that was after the laboratory examinations had been made. I did suggest, however, that the eye grounds be carefully examined. The only affection other than encephalitis that occurred to me was brain abscess due to an infected embolus on account of the high white cell count. Of course we also have this in encephalitis. I believe we always ought to be on the lookout for brain abscess in cases of this kind. The blood noted in the spinal fluid was suggestive of cerebral hemorrhage. I inquired particularly of the internes whether this was in the spinal fluid when withdrawn or whether it was from a slight hemorrhage in the skin during the puncture. They seemed quite sure that the blood was in the spinal fluid when the puncture was made. This would indicate that there was possibly a large hemorrhage in the brain which had extended into the ventricle; but this would likely cause a Babinski on the opposite side as well as the paralyzed side from pressure. Had there been such a large cerebral hemorrhage the patient would probably have died within twenty-four to forty-eight hours. The fact that he has lived so long without the development of more serious symptoms, the fact that examination of the eye grounds showed no papillitis or evidence of increased intra-cranial pressure so far as the fundus is concerned, the case looks to me now like it must be one of encephalitis possibly of the acute fulminating type. I do not know that I have ever heard of a case before where the sudden inflammatory process was so acute, and I thought perhaps there was some hemorrhagic condition, malignant hemorrhagic type possibly. However, I do not know much about that type of encephalitis, but if there is such a type that might account for the blood in the spinal fluid if actually present in this case. An embolus alone, would not produce hemorrhage in the cord.

John J. Moren: I saw this patient on Monday or Tuesday at the request of Dr. Tuley. On ex-

amination at that time I noted a positive Babinski on the left side and a questionable Babinski on the right side. The man also had a double Kernig according to my interpretation. His pupils reacted to light. The next day I was in the hospital and saw the patient again. He then had a Babinski on the right which was equal to that on the left side. He could be aroused without very much difficulty. I asked him if he had any pain and he shook his head no. He answered several questions, promptly by nodding his head. I then tested his sensation by asking him to raise his hand when he felt the pin stick and found that he did not respond to pin pricks over the entire left side of his body. I could stick him with a pin on any part of the left side and he would not raise his hand, but when touched on the right side he raised his hand immediately. He not only had hemiplegia, but a complete hemi-anesthesia. Considering all the symptoms which the patient presented I thought his condition one of cerebral embolism, or hemorrhage. Such a lesion occurring in the posterior limb of the internal capsule could give us hemi-anesthesia with spastic paralysis, he presents. I hardly know how to account for the elevation of temperature unless it be reaction of an injury to the brain, which sometimes occurs. Dr. Moore's suggestion may account for an elevation of temperature at this date. I have seen about 45 cases of encephalitis, some died within five or six days, others apparently recovered, I have seen many complicated cases, but have never seen a case that resembles the picture presented by this man. However, cases of encephalitis have been reported with hemiplegia, but the onset is not as acute as in the case presented here tonight.

Wm. A. Jenkins (closing): Careful physical examination in the case reported revealed nothing to account for the symptoms presented so far as the patient's chest and abdomen were concerned. The temperature has risen gradually during his illness and his pulse rate has increased but not constantly. The failure of the patient to respond to pin pricks is easily explained by the disturbance of his reflexes. There was no anaesthesia in my opinion. When I touched his left foot with a pin there was some reflex movement. I made this test today and there can be no question about its correctness. The patient is not restless although he has a high fever. He is lethargic but can be aroused without any difficulty. My examination did not show any marked Babinski at any time, and so far as the Kernig sign is concerned he could extend his foot as far as anyone. The blood pressure has remained 120 mm. Hg. throughout.

I have seen a few cases of fulminating encephalitis and believe several others have been

recorded in the literature. The development of hemiplegia in this case was sudden, but whether the disease was sudden in its onset I do not know because no history can be obtained. He might have had elevation of temperature, headache, etc., for several days and said nothing to his associates about the matter. Sometimes the initial symptoms are so mild in encephalitis, (as they are in other diseases) that they are not recognized until serious damage occurs.

I see no reason for suspecting an embolus in this case. I do not see where an embolus could have originated. It is not an ordinary case of hemorrhage as the arteries are normal and the heart is in good condition. It is well known that pathologically encephalitis may attack any part of the nervous system central or peripheral. No two cases behave exactly alike. I have seen three cases in which the onset was sudden.

NOTE: The patient died two days after this report was made, with no material change in the clinical aspects of the case. The heart action became weaker and weaker, he was unable to swallow, his remaining strength was quickly used up, and death ensued. The lungs remained clear to the end.

Post-mortem examination was refused.

To Ward Off By-Effects of Neo-Arsphenamin.—

Sicard and Parf theorize to explain the efficacy of intravenous injections of an alkali in treatment of the serious symptoms encountered with injection of neo-arsphenamin. They explain it by the recent research of Lumiere and Kopaszewski which seems to demonstrate that antiflaking substances introduced into the blood will protect it against the shock sometimes observed with neo-arsphenamin. The substance they have selected for the purpose is sodium carbonate, injecting into the vein 30 c.c. of physiologic saline containing 0.60 or 0.75 gm. of sodium carbonate, following through the same needle with the solution of neo-arsphenamin. This protects against the shock as effectually as Besredka's method of preliminary injection of a small amount of the antigen. Skeptophylaxis is realized. In the discussion that followed, Milian stated that he had been using for the same purpose sodium hydroxid but he explains the action in another way. He thinks the alkali prevents the splitting up of the arsenical, which is responsible for the crises nitritoides in connection with supraenal insufficiency. He has been advising this alkalization since 1912, and has been able to ward off these nitritoid symptoms by adding a sodium salt to the solution of the arsenical.

Kentucky Medical Journal

PUBLISHED MONTHLY BY

THE KENTUCKY MEDICAL ASSOCIATION
Incorporated

Editorial and Business Office, Cor. State and Twelfth Sts.

Entered as second class matter October 22, 1906 at the Postoffice at Bowling Green, Ky., under act of Congress, March 3, 1879.

Subscription Price\$2.00

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Next Meeting Seelbach Hotel

Louisville, September 19, 20, 21, 22, 1921

COUNTY SOCIETY REPORTS

Adair—Adair County Medical Society met in the County Judge's office in the court house, Columbia, May 19, 1921, for the purpose of electing officers for 1921, and collecting dues. The following physicians were present: R. C. McChord, Lebanon; W. F. Cartwright, Columbia; R. Y. Hindman, Columbia; C. M. Russell, Columbia; W. J. Flowers, Columbia; S. A. Taylor, Montpelier; O. P. Miller, Columbia, and S. P. Miller, Columbia.

The following officers were elected: W. F. Cartwright, president; S. P. Miller, secretary; delegate to State Medical Society, Woodruff Flowers; alternate, O. P. Miller; board of censors—R. Y. Hindman, C. M. Russell and O. P. Miller.

Regular meetings to be held first Thursday in each month at 1:00 p. m..

R. C. McChord read a very interesting paper which was very much appreciated as it was full of valuable information.

S. P. MILLER, Secretary.

Breathitt—At the regular meeting of the Breathitt County Medical Society, the following officers were elected: O. H. Swango, president; C. H. Hurst, vice-president; D. H. Kash, secretary; Wilgus Bach, delegate.

D. H. KASH, Secretary.

Harrison—The Harrison County Medical Society held its regular monthly meeting at Elks' club rooms June 6, 1921. Members present: Drs. Givens, Petty, Rees, N. W. Moore, Wells, McIlvain, W. N. Carr, Becket, Martin, Ross, W. B. Moore, Swinford, McDowell, Wyles, Morgan, Righter, Renfro, Haviland, Carr, Clark and Kendall of Falmouth, and C. M. Paul of Cincinnati. Meeting called to order by President Martin. Minutes of last meeting approved as read.

G. H. Ross reported case of cancer of the liver.

B. B. Petty reported case of cyst in broad ligament; patient operated on by Dr. Paul and found adhered to intestines, ureter and colon, making its removal very difficult.

E. S. McIlvain read paper on The Relation of Tonsil Infection to Systemic Diseases; discussed by L. S. Givens, J. E. Wells, G. H. Ross, N. W. Moore, H. C. Clark and W. H. Carr, and closed by essayist.

Meeting adjourned to lunch with Dr. Swinford.

W. B. MOORE, Secretary.

Hickman—Hickman County Medical Society met in the office of W. W. Richmond, April 7, 1921.

This being the 75th anniversary of our dis-

tinguished host, the society extended to him hearty congratulations, to which he responded in his characteristic manner.

Charles Hunt read an excellent paper on "Acute Mastoiditis." W. P. Moss, E. B. Morris and W. F. Peebles lead in the discussion.

W. R. Moss reported an interesting case of cretinism in a child six months old.

The society adjourned to meet at Columbus, May 5, 1921.

W. F. PEEBLES, Secretary.

Johnson—The following officers were elected for the Johnson County Medical Society: J. C. Sparks, president; Grant Rice, vice-president; E. E. Archer, secretary; J. R. Wells, treasurer; E. E. Archer, delegate.

E. E. ARCHER, Secretary.

Lee—At the regular meeting the following officers were elected: G. S. McDonald, president; J. H. Evans, vice-president; A. B. Haskins, secretary; Roscoe Pryse, treasurer; J. P. Sutton, delegate; L. Knox, Wayne Pryse and A. B. Haskin, censors.

A. B. HASKIN, Secretary.

Owen—The following officers were elected at the regular meeting of the Owen County Medical Society: J. H. Chrisman, president; J. W. Botts, vice-president; K. S. McBee, secretary-treasurer; George Purdy, delegate; George Purdy, J. W. Taylor, Marion Randsell, censors.

K. S. MCBEE, Secretary.

Scott—The following officers were elected at the annual meeting: H. V. Johnson, president; J. W. Baird, vice-president; C. T. Lancaster, secretary-treasurer; A. N. Crain, delegate; W. S. Alphin, alternate; W. S. Alphin, J. E. Paek, R. W. Porter, censors.

C. T. LANCASTER, Secretary.

Todd—The Todd County Medical Society met at Trenton June 1, the regular meeting day. The following members present: R. L. Boyd, Allensville, president; W. E. Bartlett, Elkton, secretary; E. T. Riley, C. M. Gower, R. W. Frey and R. L. Cobb, Trenton; G. W. Lacey and E. R. Yost, Kirkmansville; E. W. Weathers of Elkton.

E. R. Yost became a member of our society. He is a son of the late and lamented Judge Yost, so well known to Kentucky for his great averdupoise, as well as gray matter, and I can truly say that Dr. Yost is one of the largest (if not the largest) members of our society.

No special papers were read, but the day was spent in the report and discussion of clinical cases.

C. M. Gower discussed the subject of intravenous treatment, which was entertaining as

well as enlightening to every one present. Dinner was served by Mrs. Bob Williams, who always knows just what a hungry doctor wants and needs, and to say the doctors did ample justice to the tempting viands would be putting it mildly.

The meeting adjourned to meet July 6, at Kirkmansville, and we expect this to be the banner meeting of the year to all who are lovers of angling for the finny tribe.

E. R. Yost and G. W. Lacy extend a special invitation to remain over for a few days fishing in the clear, babbling, bubbling waters of Pond river.

W. E. BARTLETT, Secretary.

Union—The following officers were elected at the regular meeting of the Union County Medical Society: D. C. Donan, president; J. F. Lynn, secretary-treasurer.

J. F. LYNN, Secretary.

NEWS ITEMS AND COMMENTS

The Elam Drug Co., of Henderson, has arranged with E. R. Squibb & Sons to establish a depot for the distribution of Antitoxins and Vaccines at the Kentucky State Board price. They have a large supply on hand in a refrigerator, and also have a depot with a complete set of laboratory containers for the laboratory specimens, and are ready to serve the physicians of the city and county.

Dr. C. W. Dowden, Louisville, announces the association with him of Dr. C. D. Enfield, formerly of Iowa, who will engage in general diagnostic work, with especial attention to Roentgenology.

Cancer research, stimulated by the visit of Mme Currie and by the progress in experimentation reported by Dr. Francis Carter Wood, Director of the Crocker Laboratory, will be taught at Columbia University, New York, during the Summer Session, it is announced.

The course will be given at the Crocker Laboratory, 1145 Amsterdam Avenue, New York, where large numbers of tumor-bearing mice are patients, and will deal with the morphology and biology of tumors, under the direction of Prof. W. H. Woglom of the laboratory staff.

"The instruction," says the announcement, will consist of a series of lectures and laboratory exercises, and is intended to give the student sufficient experience to enable him to diagnose all the commoner varieties of tumors. It is planned especially for the needs of those who are to take up hospital or public health labora-

tory positions which may require the microscopic diagnosis of tumors.

"The classification of human and animal tumors will be first considered. The method of transplantation of tumors in animals will be shown. The simpler procedures for fixing, sectioning, and staining tissues for diagnosis will then be taken up. The major portion of the time, however, will be devoted to the study, from a diagnostic aspect, of human tumors, with practical exercises in diagnosis and demonstration of a large series of type slides."

A series of courses in medicine will also be given this summer by the College of Physicians and Surgeons. Prof. O. S. Strong will teach neuro-anatomy at the Neurological Laboratory, and a course in clinical pathology will be directed by Prof. K. M. Vogel, at the Laboratory of Clinical Pathology. Dr. P. C. Potter will give instruction in minor surgery and bandaging at the Vanderbilt Clinic. Other summer courses include anatomy and bacteriology.

BOOK REVIEWS

A Text Book of Pathology—By Alfred Stengel, M. D., Sc. D., Professor of Medicine, University of Pennsylvania, and Herbert Fox, M. D., director of the Pepper Laboratory of Clinical Medicine, University of Pennsylvania. Seventh edition, reset. Octavo of 1,111 pages with 509 text illustrations, many in colors, and 15 colored plates. Philadelphia and London: W. B. Saunders Company, 1921. Cloth, \$8.50 net.

The present edition of the Text Book of Pathology follows the style of previous issues in presenting the matter in paragraphic reference form, although so much new matter has been added and so extensive a revision of every section has been made by the rapid increase in pathologic knowledge during late years, that a complete resetting of the whole book was decided upon. The additions however have been in the direction of new matter and detail, with a careful avoidance of speculation and controversy, the attempt being to give the practitioner and student a conservative defensible opinion of the subject as it is understood today.

Some entirely new sections have been added; several important headings, such as those dealing with nephritis, influenza and lymphomata, have been rewritten. Replacements and additions of illustrations to the extent of about a hundred have been provided.

Eye, Ear, Nose and Throat Nursing—By A. Edward Davis, A. M., M. D., professor of diseases of the eye in the New York Post-Graduate Medical School and Hospital, and Beaman

Douglas, M. D., professor of diseases of the nose and throat in the New York Post-Graduate Medical School and Hospital. Second revised edition, with 32 illustrations. F. A. Davis Company, publishers, Philadelphia. Price \$2.50 net.

In the second edition of this little volume every chapter has been carefully revised, new matter incorporated and an entirely new chapter on Vaccine and serum treatment added. As stated in the first edition this book is meant simply as a guide for nurses and students in the care of various diseases of the eye, ear, nose and throat, and to instruct the nurse as to her exact duties during and following operations upon these organs. We trust that it may continue to be useful and a safe guide in her hands.

Maternitas: A Book Concerning the Care of the Prospective Mother and Her Child—by Charles E. Paddock, M. D., Professor of Obstetrics, Chicago Post-Graduate Medical School, Assistant Clinical Professor of Obstetrics, Rush Medical College, Attending Obstetrician, St. Luke's Hospital. Cloyd J. Head & Co., 304 South Dearborn St., Chicago, Illinois, Publishers.

The aim of the author in presenting this little work is to aid the prospective mother during her pregnancy, and to guide her in those trying days and weeks after the baby has come and the trained nurse has been dismissed. He has endeavored to explain some of the many perplexing questions which present themselves to her at these times, but which she considers hardly necessary to discuss with her physician.

It is hoped that the busy practitioner may find in the book a not unworthy adjunct to his own advice, especially since it is not intended in any sense of the word as a medical guide. The writer has tried, rather, to impress upon the mother who reads it the importance of co-operating with her physician and of early consultation with him on all those matters which properly demand his attention.

Treatise on Fractures in General Industrial and Military Practice—by John B. Roberts, A. M., M. D., F. A. C. S., Emeritus Professor of Surgery in University of Pennsylvania Graduate School of Medicine; President of the American Surgical Association; Member de la Societe Internationale de Chirurgie, and James A. Kelly, A. M., M. D., Associate Professor of Surgery in University of Pennsylvania Graduate School of Medicine; Attending Surgeon to St. Joseph's, St. Mary's, St. Timothy's and Misericordia Hospitals. Second edition, revised and entirely reset, with 1081 illustrations, radiograms, drawings and photographs. J. B. Lippincott Company, Philadelphia and London.

The object of this book is to supply students and medical practitioners with a clear, concise

and systematic presentation of the subject of fractures. A careful classification of the varieties of fractures occurring in each bone is given, together with statistics, symptomatology, diagnosis, prognosis and treatment. The varieties of fractures are shown by well selected radiograms, the displacement of fragments is illustrated by accurate drawings.

The purpose of the author is to present a lucid view of the subject in the light of recent discoveries, to point out an accurate scientific procedure. The volume is well illustrated with photographs of specimens, patients, dressings and copies of skiagrams.

Operative Surgery, for Students and Practitioners—by John J. McGrath, M. D., F. A. C. S., Professor of Surgery, Fordham University; Consulting Surgeon to the Peoples Hospital; Visiting Surgeon to the Fordham, Columbus and New York Foundling Hospitals; Fellow of the American College of Surgeons; Fellow of the New York Academy of Medicine; Member of the American Medical Association. Sixth revised edition, with 369 illustrations, including full page color and half-tone. F. A. Davis Company, Publishers, Philadelphia, 1921. Price \$8.00.

A more practical work for the average practitioner in the surgical field could not be recommended. Dr. McGrath in his thorough revision of this edition has incorporated all the new advances of any value in the field of operative surgery, including those developed during the great world war as well as important advances in the domain of civilian life and practice.

Rational Treatment of Pulmonary Tuberculosis—by Charles Sabourin, M. D., Medical Director of the Durtol Sanatorium, Puy-de-Dome, France. Authorized English translation from the sixth revised and enlarged French edition. F. A. Davis Company, Publishers, Philadelphia, 1921. Price \$3.50 net.

Recognized as a leading authority in Europe on this ubiquitous disorder, Dr. Sabourin in this volume presents many new facts and procedures of practical value in its management. The great popularity of this work is evidenced by the publication of six large editions in the original French. This translation being from the latest edition.

Tuberculosis of Children; Its Diagnosis and Treatment.—By Professor Dr. Hans Much, Director of the Department of Science of Immunity and for the Research of Tuberculosis at the University of Hamburg, Germany. Translated by Dr. Max Rothschild, Medical Director of California Sanitarium for the Treatment of Tuberculosis, San Francisco and Belmont, California. The Macmillan Company, New York, 1921. 8vo. 156 pages. Price \$2.50.

Dr. Much advances a new theory of treatment based on his belief as to the beginning of the disease in the glands and its spread from there to the lungs or other organs.

A Primer for Diabetic Patients—A brief outline of the Principles of Diabetic Treatment, Sample Menus, Recipes and Food Tables. By Russell M. Wilder, M. D., May A. Foley, and Daisy Ellithorpe, Dieticians, The Mayo Clinic. 12mo of 76 pages. Philadelphia and London: W. B. Saunders Company, 1921. Cloth, \$1.50 net.

The need for a brief outline of the principles underlying the dietary treatment of diabetes was felt by us in the daily instruction of patients in the matter of their diets and hygiene. Dr. Elliott P. Joslin's "Diabetic Manual" has been a great help but we desire something more like a primer to place in the hands of the patients. For this reason an outline was prepared and mimeographed; copies of this were used for several months, when the demand for them made it necessary to publish the outline in the present form.

We entirely agree with Dr. Joslin that the education of the patient is essential to successful treatment. It may be true that an occasional nervous person is hurt by such procedure, but those who are benefited vastly outnumber those who have been harmed. We can name only 2 of more than 100 patients treated on the diabetic service of the Mayo Clinic during the past year who might have been benefited more had they been left in ignorance of the nature of their condition.

Keen's Surgery—Volume VIII.—By Surgical Experts. Edited by W. W. Keen, M. D., L. L.D., Hon. F. R. C. S., Eng. and Edin., Emeritus Professor of the Principles of Surgery and Clinical Surgery, Jefferson Medical College, Philadelphia. Octavo of 960 pages with 657 illustrations, 12 of them in colors. Philadelphia and London: W. B. Saunders & Company, 1921. Price: Volume VII and VIII and Desk Index, Volume Cloth, \$25.00 net per set. Sold by Subscription.

In order to have this great work reflect the surgical progress made during the great war period and since, immediately after the Armistice Dr. Keen began to assemble a staff of surgical experts for the work of revision. All this new surgery, by those exceptionally well equipped to teach others, has been included in two volumes—Volumes VII and VIII. Then to make consultation of the work the easiest thing in the world, the publishers have issued a Separate Desk Index Volume, making instantly available every item in any subject discussed in the 8700 pages comprising the complete work of eight volumes. No one but Dr. Keen could have brought together such an assemblage of surgical authority, representing the best surgical thought of Europe as well

as of America, the entire work being edited in the strictest sense of the word by Dr. Keen himself. It is this weight of authority that established for Keen's Surgery the confidence it enjoys. Its principles are sound; its practice safe.

Principles of Hygiene.—A Practical Manual for Students, Physicians and Health Officers. By D. H. Bergey, M. D., Dr. P. H., Assistant Professor of Hygiene and Bacteriology, University of Pennsylvania. Seventh Edition, thoroughly revised. Octavo of 556 pages, illustrated. Philadelphia and London: W. B. Saunders Company, 1921. Cloth, \$5.50 net.

The new (7th) edition is just ready. The book has large chapters on air, heating, water supply, garbage disposal, food adulterants, meat inspection, personal, industrial, school hygiene, soil, house construction from a sanitary standpoint, vital causes of disease, immunity, biologic aids to diagnosis, prophylaxis, disinfection, quarantine, (including quarantine laws), vital statistics.

Medical Electricity, Roentgen Rays and Radium with a Practical Chapter on Phototherapy—by Sinclair Tousey, M. D., Consulting Surgeon to St. Bartholomew's Clinic, New York City. Third edition, thoroughly revised and greatly enlarged. Octavo of 1337 pages with 861 practical illustrations, 16 in colors. Philadelphia and London: W. B. Saunders Company, 1921. Cloth, \$10.00 net.

For this new (3rd) edition Dr. Tousey has given his work a most complete revision, new matter increasing it in size 118 pages. Some of the new matter includes the latest results in dental and gastro-intestinal radiography and in the standardization of apparatus and technic; tables showing the correct exposure for radiographs of every portion of both sexes, etc.

The Principles of Therapeutics—by Oliver T. Osborne, M. D., Professor of Therapeutics Department of Medicine, Yale University. Octavo 881 pages. Philadelphia and London: W. B. Saunders Company, 1921. Cloth \$7.00 net.

Dr. Osborne's new book includes prescription writing, a commentary on the valuable drugs and preparations of the United States Pharmacopoeia, a therapeutic classification of drugs, and a description of their action and uses. Endocrinology is presented in a chapter of 115 pages. The various physical methods of treatment, electricity, massage, exercise, climate and medicinal springs are described. Special treatments for acute and chronic poisoning by drugs and the treatment for most emergencies are outlined. Rational treatment for simple external disturbances are suggested, practical advice concerning equipment and preparedness is given, the National drug laws are described, reportable contagious dis-

eases are listed, and a chapter on medical ethics completes the book.

Traumatic Surgery—By John J. Moorehead, M. D., Professor of Surgery and Director Department of Traumatic Surgery, New York Post Graduate Medical School and Hospital. Octavo of 864 pages, with 620 illustrations. Cloth \$9.00 net. W. B. Saunders Philadelphia, Publishers.

The first edition of Dr. Moorehead's book met with instant and remarkable success. Published in February, 1917, it went to press for reprints in April, August and November of the same year.

The new (2nd) edition—just issued—was delayed by Dr. Moorehead's overseas service, so that it now comes to the profession reflecting the very latest methods of diagnosing and treating traumatism of all kinds.

But the work is more than a traumatic surgery—it is minor surgery as well, detailing the treatment of such conditions as fractures, dislocations, wounds (particularly infected wounds), felons, paronychia, hammer-toe, burns, bunions, bursitis, synovitis, etc.

There are 619 illustrations, mostly original, each driving home the particular point under discussion. The industrial surgeon will find this book valuable to him, but no more so than the general practitioner and surgeon.

Gynecology.—By Brooke M. Anspach, M. D., Associate in Gynecology, University of Pennsylvania. With introduction by John G. Clark. 526 illustrations. J. B. Lippincott Company, Publishers, Philadelphia and London.

This very valuable book presents the subject in a systematic form, giving all the necessary information, and omitting such details as are not immediately required for practical purposes. A thorough acquaintance with the subject presented in this way will provide the student with a fund of information that clinical teaching and clinical experience will tend to crystallize and render applicable. In the library of the busy general practitioner the comprehensive text-book stands as a guide to the accurate diagnosis and the successful treatment of gynecologic conditions most frequently encountered.

THE FORUM

TO THE EDITOR:

In the May number of the JOURNAL, on page 262 you have me mixed with Dr. Ben L. Bruner in the discussion of Dr. Dabney's paper at the Jefferson County Medical Society.

W. T. BRUNER, M. D.

KENTUCKY MEDICAL JOURNAL

BEING THE JOURNAL OF THE KENTUCKY STATE MEDICAL ASSOCIATION

Published Under the Auspices of the Council

VOL. XIX. 

BOWLING GREEN, KY., AUGUST, 1921

No. 8

EDITORIAL

A PLEA THAT THE ITINERANT DOCTOR DISGRACE BE ENDED.

Kentucky has by far the best, fairest and most practical medical laws in the Union, as is indicated in the able opinion of Judge Burgevin to be found under the head of Official Announcements in this issue of the Journal, which should be studied carefully by everyone interested in the welfare of the afflicted people and the good name of the medical profession of the State.

Under former laws the offenders often escaped conviction by making the plea that, as they used no drugs, what they did could in no sense be construed as the practice of medicine, but, in order to obviate any possible misconstruction of the law upon this subject by the courts, or any one proposing or attempting to do any kind of healing, the new Drugless Practice Law passed by the last Legislature, is made to apply in such plain terms to "practitioners of any drugless or limited school or system of diagnosing or treating human ailments, defects or deformities, now in existence or which may hereafter be devised," as to give no chance for any evasion or misunderstanding of its provisions.

It is a pleasure to say, too, that the Assistant Examiners of the various drugless systems of practice provided by this law are giving the State Board of Health such cordial cooperation in its enforcement, hunting down offenders, securing evidence, appearing in court at trials, and asking the revocation of certificates of those violating the conditions upon which they were issued, as to induce the Board to make this appeal to the organized profession in every county in the State for the same kind of systematic cooperation in dealing with all classes of offenders against the medical law, but specializing for the balance of this year on the "Itinerants of all systems of practice and the impudent and abusive Nostrum Vending Troupes."

For the information of the profession and especially of County, City and District Attorneys asked to prepare the warrants and

prosecute these vampires, whose business it is to prey upon poor sick people, it will be well to remember that Section 2614 of the Statutes reads, "Nothing in this law shall be so construed as to authorize any itinerant doctor to register or practice in any county in this State;" that Sub-section 6, Section 2615, makes this apply with equal force and increased penalties to each member of any troupe of nostrum venders; that Rule 7 of the Board under the new drugless practice law makes it apply to itinerant optometrists and every other class of traveling healers, and that Sub-section 3, Section 2054 of the Acts of 1918, provides, "That it shall be the duty of the County and Commonwealth Attorneys and the Attorney General, within their respective jurisdictions, to represent the State and Local Boards of Health in all matters relating to the enforcement of the health and medical laws and the performance of the other duties of such boards."

With a proper organization in each county for such work and an alert committee, which will dare to study and enforce the law, and explain the purpose of the work to them beforehand, it will be found that the prosecuting officials will be only too glad to advise as to the required evidence, to prepare the warrants and then see the cases through the courts. In order to assist in getting up the proof the State Board of Health offers a standing reward of twenty-five dollars for the arrest and conviction of any of the offenders above mentioned, payable to whoever does the work, upon the order of the county society, health officer or county attorney. Three troupes with a total of nineteen members began operations in different sections of Louisville a few weeks ago but, within two days, all were under arrest and, after the assessment of the fines, which was promptly done, they left the State vowing never to return. Similar experiences have occurred at Middlesboro, Covington, Tiline, Livingston County, and several other places, and a troupe was chased out of Union County last week through the active efforts of County Attorney Earl L. Fowler, and, if the profession can only be awakened to its full duty to the public in this matter, quackery will soon have no existence except as a memory within the boundaries of Kentucky.

ANNUAL SCHOOL FOR HEALTH OFFICERS AND HEALTH NURSES OF KENTUCKY:

Far and away the most important and enthusiastic of the Schools for County and City Health Officers and Health Nurses, covering the entire week, with the interest profitably sustained for every hour of the time, began at the State Board of Health Building, Corner Sixth and Main streets, Louisville, Monday, June 20, 1921. This School was established, and attendance made compulsory for every health officer in the State, with all of the expenses of such attendance paid by the fiscal authorities of the respective counties and cities, by an act of the General Assembly in 1911, and has been highly successful from the outset, this being the tenth annual meeting.

In former years the teaching force for the school was drawn in large part from the health departments at Washington or of other states which had been most successful in special lines of work in regard to which our health officials desired stimulation and practical instruction. By a natural process of evolution and growth, directly incident to the inauguration of full health departments in eight progressive, widely distributed counties, each with specially trained all-time health officers and nurses, so supported that they could devote their entire time and lives to the prevention rather than to the cure of disease, and by the development of an active teaching force in the faculty of the School for Health Officers and Nurses, composed of leading physicians and welfare workers, and conducted jointly by the University of Louisville and the State Board of Health, it was decided for this year to rely upon this home talent as instructors and demonstrators, and it is a pleasure to be able to say that no one of these failed to meet the expectations of the school and those responsible to and for it. Joint or separate sessions for the health officers and for the nurses from day to day were arranged for in the program so as to cover protection for almost every phase of human life from the prenatal care of the mother, of the infant, the child and the adult, as will be shown by extracts taken at random from it, as follows:

MONDAY MORNING, JUNE 20, 1921.

JOINT SESSION

J. G. South, President, State Board of Health, presiding.

9:00 Registration.

9:30 Administrative Program of the State Board of Health.

A. T. McCormack, M. D., State Health Officer.

10:00 Organization and Administration.
Mr. Elwood Street, Director, Louisville Welfare League.

MONDAY AFTERNOON, JUNE 20, 1921

JOINT SESSION

Section of Bureau of County Health Work.

P. E. Blackerby, Director, presiding.

1:30 Communicable Diseases, Their Prevention and Control,

G. W. Duvall, All-Time Health Officer, Daviess County.

2:00 County Health Department Anti-Inoculation Activities,

Wm. N. Lipscomb, M. D., All-Time Health Officer, Scott County.

2:30 The Venereal Problem. An Important Phase in the Program of an All-Time County Health Department,

R. D. Higgins, M. D., All-Time Health Officer, Boyd County.

3:00 The Medical and Legal Activities of a County Health Department,

B. W. Smock, M. D., All-Time Health Officer, Muhlenberg County.

3:30 Important Consideration in Establishing All-Time County Health Departments Permanently,

R. J. Malott, M. D., All-Time Health Officer, Harlan County.

4:00 The Relation Between All-Time County Health Departments and the Medical Profession,

Round Table Discussions: to be participated in by all present.

TUESDAY MORNING, JUNE 21, 1921.

JOINT SESSION

Section of Bureau of Child Hygiene.

Annie S. Veach, M. D., Director, presiding.

9:00 Child Hygiene the Foundation of Health Work,

F. J. Underwood, M. D., Director, Bureau of Child Welfare, State Board of Health of Mississippi.

10:00 Working Program for Child Hygiene, Edith B. Lowry, M. D., U. S. Public Health Service, Washington, D. C.

10:45 The Modern Health Crusade, Miss Jessie O. Yancey, Educational Secretary, Kentucky Tuberculosis Association, Louisville.

11:15 Physical Examination of School Children with Demonstration,

Annie S. Veach, M. D., Director, Bureau of Child Hygiene, State Board of Health of Kentucky.

TUESDAY AFTERNOON, JUNE 21, 1921.

JOINT SESSION

Section of Bureau of Child Hygiene—Continued.

- 1:00 Prenatal Clinics.
 Alice Pickett, M. D., Director, Prenatal
 Clinics, Louisville City Hospital.
- 2:00 What Constitutes a Proper Dental In-
 spection of School Children.
 G. H. Heyman, D. D. S., Louisville.
- 2:30 Supervision of Midwives,
 Emma Brown, R. N., U. S. Public
 Health Service, Washington, D. C.
- 3:00 Round Table—Discussion of Individ-
 ual Community Problems as Related
 to Child Hygiene.

These meetings have been so successful and profitable that it is in the mind of the State Board of Health to urge the attendance of all County Judges, County Attorneys and Mayors at future annual schools, and if it can be arranged, to present one or more of the most pertinent of the subjects, with illustrations and demonstrations, as part of the program of the State Medical Association from year to year.

AN ITINERANT OPTOMETRIST FINED IN LIVINGSTON COUNTY

At the request of the State Board of Health, and through the activity of that county's Board of Health, "Dr." Simon M. Jacobstein, an itinerant optometrist hailing from Louisville, was prosecuted and fined fifty dollars in the early part of June.

A certificate to practice optometry was issued to Jacobstein last year under the exemption clause of the new drugless practice law, and it is now expected that he will be cited to appear before the Board at its coming meeting to show cause, if any he can, why his certificate should not be revoked for unprofessional conduct of a character likely to deceive and defraud the public.

AN ADVERTISING CHIROPODIST CON- VICTED AT LOUISVILLE

"Dr." Roy Newall, of Chicago, an itinerant and widely advertised chiropodist, employed by several large shoe houses to hold so-called clinics for the exhibition of cheap high-priced appliances for use in the treatment of broken arches and other foot troubles, was arrested upon the advice of the State Board of Health and, upon trial before Hon. Alfred T. Burgevin, Judge of the City Court, was fined fifty dollars after a ringing decision sustaining both the legality and the wisdom of the laws protecting the people from the medical frauds against whom they are directed.

SCIENTIFIC EDITORIALS

CRYING BABIES

The problem of feeding a young baby is one of the most difficult and intricate that confronts the doctor, this in spite of the fact that the possibilities of indigestion are limited to only a few factors. It would seem a far more difficult matter to diagnose and treat nutritional disorders in the adult because their dietary is very much more varied and complicated. But this in practice is found not to be the case; the number of adults who die from starvation and from inability to provide the proper nourishment is relatively small as compared with the children who die from actual starvation, because the proper food has not been provided. Of course, tremendous progress has been made in getting the problem solved. The decrease in infant mortality shows that we have learned something in the past twenty years, that even a long accumulated experience of the race has not revealed.

A very suggestive paper by Dr. Roseman of Memphis, Tenn., on the cause of the crying of children, brought out an interesting discussion before the Southern Medical Association. Dr. Roseman advanced the idea that the so-called colic cry of young babies was not due to any derangement in the bowel, but that it was due to a real hunger. He had noted, as we all have, that children frequently begin to cry in the afternoon and keep it up until night. He believes that many mothers will furnish enough milk for the early feeding in the day, but that by afternoon her milk supply has practically given out, and that the baby will then cry vigorously because he is then hungry and mad. He called attention to the fact that children will throw their heads backward and have warm hands and feet. The child that suffers from a real colic will have cold hands and feet and always bends forward.

The discussion brought out many practical points: First of all that it was important to ascertain the exact amount of milk that the baby was getting. It must be weighed before and after each nursing, so that the exact amount of milk obtained from the breast can easily be learned. In many cases it will be found that after a good rest the mother will make enough milk for the baby, but that after several nursings and with the distractions of the day's work or pleasure, the amount of milk will be very greatly reduced, and that the afternoon nursing will average less than half the early morning nursing. In such cases it will be found necessary to make up

the lack with some other milk at that time when the mother's milk is insufficient.

The maintainance of adequate milk supply on the part of the mother requires proper feeding, exercise, recreation and rest, but perhaps more important than any of these is that the breast shall be thoroughly emptied at the time of the nursing if the baby does not take all the milk at its feeding. The breast should be immediately thoroughly emptied of the residue; otherwise there will be a gradual diminution in the amount of milk secreted. Sedgwick has called attention particularly to the importance of carefully and completely emptying the breast. It is particularly pertinent that the obstetrician in the early care of the baby shall see that the breasts are completely emptied. Many times a mother will have an abundance of milk up until the second or third week, then the milk rapidly dries up. If attention is paid to this point it is believed that many mothers will be able to continue to nurse the baby wholly at the breast.

PHILIP F. BARBOUR

INFANT FEEDING.

At the present time it is pretty well agreed that the part of cows' milk which makes trouble for the bottle-fed baby is the curd. This is true because the casein in cows milk forms a tough curd which resists the action of the digestive juices. We have all seen great hunks of curd which have been vomited by bottle babies. Now anything which will make this curd soft and flocculent instead of hard and tough will make its digestion easier. Many things have been proposed for this purpose. There is one thing which has been very little used in this country but which has been used extensively abroad and which because of its simplicity, efficiency and cheapness ought to be more generally used here.

Sodium Citrate added to milk with junket in a test tube produces a curd which falls like snow to the bottom of the tube. Gentle agitation distributes this fine curd evenly throughout the whey making a cloudy mixture. If junket alone is added to milk in another tube the curd will form as a tough mass which contracts leaving a clear whey. Even violent agitation will not break this tough curd up. If sodium citrate in the strength of one grain to the ounce is added to the milk of a bottle fed baby the effect is the same as in the test tube. The curd is finely divided and soft and the digestive juices can easily penetrate and digest it. It is said by those who have tried it that full

cow's milk may be fed to a new born infant if it is treated in this way. It is neither wise nor necessary to try such extreme measures as this, but we may easily and safely add the citrate to the ordinary dilutions which we use for the different ages. Where one is dealing with mothers of ordinary intelligence and in those cases where the doctor cannot see the baby often and the mother must be left largely to her own resources, this method certainly commends itself. It is no innovation but has been tried out in large clinics and on many thousands of babies. Those who have used it are most enthusiastic in commending it for its simplicity and its uniformly good results.

R. H. COWLEY

OFFICIAL ANNOUNCEMENTS

IMPORTANT DECISION UNDER THE NEW DRUGLESS PRACTICE LAW

Louisville City Court. Decision June 25, 1921. Commonwealth vs. Roy Newall, an Itinerant Chicago Healer. Opinion of the Court by Judge Burgevin.

The Defendant is charged with violation of Chapter 31 of the Acts of the General Assembly of 1920.

It appears that advertisements were published in various newspapers notifying the public to come to a certain shoe store where they would have the opportunity of consulting free of charge and obtaining the advice of Roy Newall, specialist, who would give them expert advice in the matter of sore, tender feet or other foot ailments. No specific statement was made in the advertisement that the expert is a chiropodist or doctor of medicine, but the impression is made upon the mind of the reader that he is a chiropodist or person peculiarly qualified by experience or knowledge to give advice as to the treatment of foot ailments. It is shown that the prosecuting witnesses were drawn directly or indirectly by this advertisement to the store in question. It is manifestly the purpose of the advertisement to attract the public.

The prosecuting witnesses asked to see the expert and were told that the doctor was busy but would see them in a few minutes. They waited and the alleged expert did see them, examine their feet and told them that what was needed to correct the trouble from which they professed to be suffering was certain mechanical arches which were sold in the store. While one of the prosecuting witnesses was waiting she observed a gentleman,

whom she knew was suffering from stiff ankle, being treated or advised by the expert, who instructed in her hearing that the shoe of a certain artificial arch which he recommended would render the ankle flexible. The testimony of the medical experts is to the effect that it would be impossible for an artificial contrivance, such as the arch in question, to bring about that result. The testimony of the witnesses, therefore, is that the alleged specialist or expert did advise them and, in fact, prescribed the arches that were sold in the store.

It is the duty of the strong and the enlightened to protect the weak and ignorant from deception and imposture. It is peculiarly the duty of those in authority to enforce the laws enacted by the legislative department of the Government for the protection of the weak and ignorant against charlatanism. The statute in question is a remedial one enacted under the police power of the legislature for the protection of the health and the well-being of the public and, under the rule of construction applicable to such statutes, should be liberally considered to effect the purpose intended. In the age old struggle of science against ignorance it has been fully demonstrated that no branch of the subject demands more the attention of the legislature than the health of the community, as somebody has well said, "Man's health is a heavenly gift within a holy shrine to be approached and touched with serious fear by hands made pure and hearts of faith severe."

The legislature has recognized that some standard of proficiency and good moral character must be required of those who undertake to practice the healing art, and it has endeavored to establish such standard by certain requirements of all persons who propose to practice medicine in any of its branches, requirements which, in the wisdom of the legislature, should be demanded. Many such requirements are those provided in the Act in question. It is made necessary, I think, by the act, that the persons who propose to treat foot ailments shall comply with the provisions of the law as much as persons who undertake to treat other ailments of the body. The foot is a portion of the body; a derangement of the normal healthy condition of the foot is a disease or ailment; disease is merely a defection from health, and if one is suffering from what is known as a fallen arch or stiffened ankle or other conditions of the feet which give pain or distress is, to that extent, suffering from disease and one who undertakes to prescribe for or to treat such suffering is undertaking to prac-

tice the healing art. Of course, any individual may treat himself if he sees fit. He may go to the drug store and purchase any of the drugs known to the pharmacist, provided they be not in the class dangerous to life and the promiscuous sale of which is therefore prohibited by law, and may prescribe for himself as he chooses, but another may not do so, claiming to possess peculiar skill or experience in the treatment of the disease. Many druggists possess, in addition to their knowledge of pharmacy, skill in the diagnosis and treatment of disease, incidental skill required by practicing their own peculiar profession, and should a druggist advertise patrons to his store saying they would have the opportunity of consulting an expert on drugs and disease and obtain his advice as to what drugs to take for any trouble that he might have and should thereby lure customers to his store, giving them advice when they came, would undoubtedly be practicing remedial medicine contrary to the requirements of the legislature upon the subject.

It is true that the expert in this case may be expert indeed. He may be fully competent to advise and treat ailments and derangements of the feet. He may be as competent, or even more competent, than practicing chiropodists who have complied with the law of this state, but that is a matter into which we need not inquire in this case, as even if extremely competent we must still comply with the law, in order to demonstrate that he comes up to the standard of skill required by the law.

Any shoe store might sell artificial arches or braces and any person who believed that the devices could be used, might purchase them and apply to himself just as he might go into a drug store and buy medicine, take it and prescribe for himself, but, when the shoe store undertakes to advertise to the public that an expert representing some famous doctor will be there to give advice, as to what appliances should be purchased and how they shall be worn, and if the advertisement is followed up by actual giving of advice to the public by the alleged expert and the sale of the appliances advised by him, it seems to me that this comes clearly within the provision of the Act of 1920 and that Act must be complied with by the expert before he can legally engage in the business of advising the public in the matters referred to in the advertisement.

PRELIMINARY SCIENTIFIC PROGRAM
OF THE SEVENTY-FIRST AN-
NUAL MEETING OF THE KEN-
TUCKY STATE MEDICAL
ASSOCIATION.

SEPTEMBER 19.—A. M.

Care of the Eyes, Ears, Nose and Throat dur-
ing Infectious Diseases of Childhood.
Federal Care of the Veterans.
Tuberculosis of the Spine.

P. M.

Basal Metabolism Determination and Its Value
Study of Gall Bladder by the Lyons-Meltzer
Drainage Tube.
Treatment of Gall Bladder Disease by the
Lyons-Metzer Drainage Tube.
X-Ray Aspects of Chronic Small Intestinal
Obstruction.
Endocarditis.
Blood Transfusion in Medical Diseases.
Arthritis.
Importance of Functional Tests in Renal Dis-
eases.

SEPTEMBER 20.—A. M.

Treatment of Stone in the Ureter.
Diagnosis of Urological Diseases.
Treatment of Bladder Tumors.
Symposium on Pediatrics:

Colitis in Children,
Value of School Inspection,
Eczema, Facial, in Children,
Bronchial Asthma.

P. M.

Goitre:

Medical Treatment,
Surgical Treatment.

Symposium on Malignancy:

Malignancy of the Breast,
Malignancy of the Uterus,
Malignancy of the Gastro-Intestinal
tract,
Malignancy of the Skin,
Treatment of Malignant Conditions
with Radium,
Treatment of Malignant Conditions
with X-ray.

SEPTEMBER 21.—A. M.

The Present Treatment of Syphilis with
Especial Reference to the Efficiency of Mod-
ern methods.
The Wassermann Reaction in Syphilis.
Treatment of Neuro-Syphilis.
Papers on Rectal Conditions.

P. M.

Immediate Repair of Lacerations versus De-
lay.
Various Methods of Performing Caesarean
Section with Indications and Contra-indi-
cations.
A Discussion of the Newer Fads in Obstet-
rics.
Multiple Sclerosis.
Encephalitis.

ORIGINAL ARTICLES.

RADIUM TREATMENT OF CANCER: A
PLEA FOR CO-OPERATION BE-
TWEEN SURGEONS AND RA-
DIO THERAPEUTISTS.*

By WM. J. YOUNG, Louisville.

It is not the purport of this paper to make any wonderful claims for radium therapy in the treatment of cancer nor to discredit any of the accepted methods of treating this dread disease, about which so little is known, but rather to make a plea for greater co-operation among those interested in its eradication. When the measures generally used in combatting this intractable disease are carefully weighed, we are still confronted by the fact that a cure for cancer is sadly needed.

Aside from our ability to diagnose malignancy earlier, and to recognize pre-cancerous lesions thereby rendering it possible to institute early therapeutic measures with greater hope of success, no advance has been made with regard to the etiology of malignant disease. The agents recognized as being the most useful in the treatment of cancer are: surgery and radio-therapy (radium and the roentgen-ray), and I wish to reiterate that it was with the hope of securing greater co-operation among those making use of these therapeutic measures that this subject was chosen.

The exact mode of action of radium on cell life is not definitely known. However, that it undoubtedly has a selective action on malignant cells has been shown by therapeutic tests. The chief action of radium is to resolve hypertrophic tissue, whether the situation be normal or foreign; and as malignancy is the reproduction of a foreign substance in normal body tissues or organs, it naturally follows that conditions simulating this type should be amenable to radium therapy. The

*Presented with lantern slides before the Kentucky State Medical Association at Lexington September 27-30, 1920.

methods of administering radium are, we hope, still in their infancy. I say this because instances of its inefficiency are frequently noted, and further because we hope from our clinical cures in others to improve our technique and thus increase the therapeutic value of this agent.

In the treatment of pre-cancerous lesions of the skin, such as senile patches, moles, papillomata, warts, etc., there is no agent as effective as radium and none productive of as good cosmetic results. Basal cell epitheliomata are always amenable to radium in massive dosage, and its curative power compares favorably with that of the knife. The squamous and prickle cell types are more resistant to radium radiation, and where the resulting deformity will not be great, it is advisable to surgically excise the lesion, extending the excision one-fourth inch beyond the diseased area and reinforcing this by a massive dose of radium, extending the radiation one-fourth inch beyond the line of the resulting scar; thus one-half inch of surrounding normal skin receives treatment, and the result is usually successful. Wherever possible, if there is infiltration beneath the skin, it is always well to resort to surgery and reinforce with radium, rather than to depend upon radium alone.

In speaking of the radium treatment of epitheliomata, I wish to especially mention the importance of massive dosage. One reason radium has largely superceded the roentgen-ray in the treatment of skin cancer is the ease with which a massive dose of radium may be given, whereas, with the roentgen-ray, the factors being less stable, the tendency is to err on the safe side and under-treat the lesion causing in some cases a seeming amelioration of the process following by stimulation. Another reason is the fact that too frequently roentgen-ray therapy is used as a side line by radiologists, and these operators are apt to be limited in their knowledge merely to the manipulation of the x-ray machine. In the treatment of skin cancer we strive to produce a clinical cure by one dose of radium. Should we fail in three doses it is our policy to admit defeat and recommend operative removal with plastic surgery should the latter procedure be necessary.

In malignancy of the lower lip, tongue, tonsil, esophagus, etc., where it is impossible for the surgeon to remove the entire lesion, or where metastases has occurred making the condition inoperable, radium is the one agent from which the greatest benefit may be expected. While the roentgen-ray should be employed to assist in blocking points of meta-

stasis, the most dependence is naturally placed upon the agent which can be brought into direct contact with the lesion. Wonderful results are often produced, some are permanent and others temporary, but they have been sufficient of the prolonged and lasting class to make radium treatment always worthy of trial.

At this point I would like to speak of the effect of under-radiation with radium. It has an effect similar to that of surgery where the operator has been unable to remove the entire malignant process; i. e., of stimulating the remaining malignancy. Therefore, it is preferable to overestimate rather than underestimate the dose. The production of burns is a matter of slight consequence when compared with the prospect of accomplishing a clinical cure and the risk of stimulating the malignancy.

The usual method of treating malignant disease of the tongue and tonsil is with radium needles which are thrust into the desired parts in such manner as to secure the maximum radiation, and the results have been encouraging in a fair percentage of cases. Here, as in cancer of the cervix, we can safely promise cessation of the foul-smelling, necrotic discharge and prolongation of life with relief from pain for an undeterminate period, possibly permanent. However, should involvement be very extensive it is better to admit defeat and avoid stimulation.

In the treatment of malignant diseases of the female pelvic organs, we have a prolific field which we share with the surgeon. Neither of us has yet shown the ability to successfully cope with the numerous situations presented here, and co-operation on the part of both leaves much to be desired. In inoperable carcinoma uteri, radium has produced startling results which are for the most part temporary. Where the cervix is involved and a foul-smelling discharge is a constant source of annoyance to the patient and those coming in contact with her, radium treatment will clarify the situation and relieve the pain which is usually present.

To recapitulate: We believe radium the most potent agent we have in the treatment of inoperable cancer of the uterus. It has the power to cause cessation of obnoxious discharges, it relieves pain, prolongs life, sometimes produces clinical cure, and often renders the disease more amenable to surgical treatment.

While not strictly germane to the subject, I wish to say that in the treatment of myomatous uterine tumors of small size and in so-called myopathic uterine hemorrhage we have in radium an agent recognized as both

efficient and reliable. For the control of hemorrhage the procedure consists in dilating the cervix under local or nitrous oxide gas anesthesia and introducing radium of certain amount surrounded by known filter for a specific time. The results from this method of treatment have been uniformly good. Where the tumor is large and the patient's condition contraindicates immediate operation, hemorrhage may be easily controlled by radium and surgical intervention postponed until the patient has sufficiently improved to warrant the operation.

In the June, 1920, number of the *Annals of Surgery*, Dr. John G. Clark, of Philadelphia, gives the following classification of myomatous cases not amenable to radium therapy:

(1) The larger tumors; as measured by the size of the pregnant uterus, the maximum being that of a three or four months' pregnancy. There are few exceptions to this rule as marked ordinarily by decided surgical contraindications, such as grave heart lesions, greatly diminished renal function, and other serious constitutional defects which ordinarily render an operation unduly hazardous:

(2) All tumors with symptoms of associated inflammatory lesions, indicated chiefly by unilateral or bilateral pain. This contraindication to radiation is based upon the fact that old inflammatory lesions may be stimulated into renewed and dangerous activity:

(3) In patients with normal or slightly increased menstruation who present a cachectic appearance and are the subjects of toxic symptoms out of proportion to their anemia.

(4) In all cases where there are symptoms of other co-existent abdominal lesions, such as cholecystitis, cholithiasis, appendicitis, etc.

In the treatment of disorders incident to the menopause with radium, my experience has been limited to a few cases. Where the loss of blood is excessive, its sudden check may be fraught with danger, and the most logical procedure is to strive to control rather than to cause an abrupt cessation of the flow. This may be accomplished by giving a short radium exposure. So far as I have been able to judge by the few cases treated, the effects of this method have been beneficial.

In cancer of the breast, pre-operative and post-operative treatment, the roentgen-ray is preferable to radium. The avenues of metastasis being so numerous and the space to be covered so extensive, it is obviously impossible to complete a uniform radiation with radium. Recurrences along the line of incision may be treated by radium, and isolated tumors transfixed with radium needles;

but blocking points of possible metastasis can be more thoroughly and easily accomplished by the roentgen-ray.

In cancer of the cervix, unless dealt with in its incipency, surgery has proven rather fruitless to ultimate results; and I believe I may say with safety—and at the same time express the general sentiment of the profession—that radium treatment, while not by any means a panacea, has proven its greatest worth in this class of cases. Even in apparently hopeless cases we sometimes attain brilliant results; and of the contraindications, I consider only one, i. e., where the process has extended beyond the uterus and has involved the abdomen to an extent where radiation below may give rise to stimulation higher.

CONCLUSIONS:

(1) That in radium we have an agent which, used singly or conjointly with surgery and the roentgen-ray, has proven productive of much benefit:

(2) That its field is definite, its limits defined, and therefore, co-operation with other methods for treating cancer feasible.

In carcinoma of the prostate, radium is used to reinforce surgery, should it be deemed wise to operate, and if considered inoperable, radium is the one means by which the condition may be directly reached. It may be applied through a suprapubic opening and buried into the mass, or enclosed in a long pin which may be passed through the perineum into the mass. Of the two methods I prefer the more direct, or through suprapubic opening, in the treatment of either bladder or prostatic conditions with radium, for the reason the radium is then placed upon or in the desired part and there is no guess as to maintaining it in position.

THE TREATMENT OF SKIN TUMORS*

By M. L. RAVITCH, Louisville.

The subject of treatment of all skin tumors, both malignant and non-malignant, is such a broad one and includes so many rare conditions that we shall not attempt to deal with all of them but shall confine this paper to those which are most apt to be met with. For convenience in discussing them, skin tumors may be divided into malignant, non-malignant, and pre-malignant. This is, of course, not a strict division, for nearly all tumors carry a possibility of malignancy, and treatment should always be carried out with a distinct

*Read before the Kentucky State Medical Association. Lexington, September 27, 28, 29, 30, 1920.

regard to the possibility of future degeneration.

It would certainly seem as if malignant disease was on the increase, although this apparent increase may be due to better diagnosis. The report of the American Dermatological Society is interesting in this regard. Reports for fourteen consecutive years showed a ratio of 87 per 10,000 of epithelioma to all skin diseases reported. Reports for the last ten years gave a ratio of 190 per 10,000, nearly double the former figures, certainly a marked increase.

The most frequently encountered malignant tumor is the prickle-cell epithelioma. From the standpoint of treatment there is not so much difference between the prickle-cell cancer or the basal-cell cancer, or rodent ulcer. The latter is usually more superficial and tends to cover a wider area, while showing very little tendency to metastasize. Then we meet with secondary carcinoma of the skin, where there is carcinoma of some internal organ which has metastasized in the skin. Histological examination of these tumors shows that their cells are neither prickle-cells nor basal epithelium cells, but partake of the characteristics of the cells of the organ which is the seat of the primary cancer. Besides these carcinomas there are sarcomas, differing from the carcinomas very little as far as the treatment is to be considered.

The method of treatment will vary somewhat according to the size, location and the extent of the tumor. Radiation is our reliance. It may be accompanied by other methods in suitable cases. Where the tumor is small in size, the use of radiation alone seems to us the method of choice. If there is considerable depth to the growth, the thickness of the tissue to be penetrated by the ray may be lessened by the use of the electrocautery. We prefer the electrocautery to the knife for this purpose, because electrocautery seals the wounds and lessens the danger of producing metastasis by opening blood-vessels and lymphatics. In addition, although this is a minor consideration, the cosmetic effect is better after the cautery than after the knife. Radiation should be begun immediately whether the cautery be used or not. Cases will be met with which are on the border line; that is, involvement of neighboring lymph glands is suspected. In these cases, the adjacent lymph-glands should be given radiation as thoroughly as the epithelioma itself. Where there is already perceptible involvement of the lymph-glands they should be thoroughly excised by the knife and the area radiated. Treatment of secondary carcinoma of the skin is practically useless

unless the primary focus is removed. Sarcomas of the skin are usually more rapid in growth and more apt to metastasize early. No thought should therefore be paid to the cosmetic result, but every effort made for a complete and early removal or destruction of every malignant cell. Extensive and wide surgical excision, followed by heavy radiation, should therefore be employed if the tumor is at all advanced.

Radiation in the treatment of malignant tumors may be carried out either with radium or the X-rays. The latter is still the method of choice where it can be employed, since it will accomplish everything that radium can accomplish. Radium, on the other hand, can be employed where it is impossible to get a good exposure with the X-rays, as for example, in cavities of the body and in fistulous tracts. Whatever the tendency of the future may be, the fact remains that at present the great majority of operators are using the X-ray for the treatment of skin malignancies. It is essential to the proper use of the X-ray, that proper apparatus should be used. A machine powerful enough to deliver sufficient radiation is one essential; ability to measure and control rays is another. We have used, in our many years of X-ray therapeutics, all the various types of machines and tubes that have been in use. The interrupterless transformer and Coolidge tubes are, in our opinion, almost essential to a proper treatment of malignant tumors. With any of the old methods, giving treatment was almost entirely a matter of guess; with the modern equipment the dosage can be regulated with an entirely satisfactory degree of accuracy. In giving the X-ray treatment one should always have in mind the strength of treatment that is desirable to give and regulate the machine accordingly. It is only a matter of a few seconds to figure this out. The formula is obtained by measuring the milliamperage, as read on the scale, multiplying by the penetration, as read by the sparkgap, and again multiplying by the duration of the treatment in minutes, the whole being divided by the square of the distance between the target and the part treated. The average skin will show an erythema after a treatment equal to one-third on this scale; even one-sixth may produce an erythema in many people. Production of moderate erythema of the tumor growth is not to be avoided, although satisfactorily rapid progress may be made even without the production of more than an extremely mild reaction. The use of too small a dosage would seem to produce a certain amount of immunity on the part of the tumor cells to

the X-ray. The deeper the growth the higher should be the penetration used. When radiating the lymph-glands the skin should be protected against the softer rays by aluminum screens. We use one millimeter of aluminum where the overlying tissue is thin; two millimeters where it is thicker. Where the screens are used the penetration must be increased and this modifies the formula which we have just given. Treatments should be repeated every five to fifteen days. It should be kept up as long as there is any elevation, ulceration, or induration. The selective activity of the ray is well illustrated by the fact that even while the malignant tissue is melting away under the action of the X-ray, there will be a regeneration of the normal tissue if the dosage has not produced too great an erythema. For that reason we restrict our dosage in most cases to the point of mild erythema.

The results of X-ray treatment in non-metastasized epithelioma are amazingly good. In nearly one hundred per cent of cases a permanent cure is obtained. Involvement of the lymph-glands means a decided drop in the percentage of cures, while in sarcomas the results are again far from what we obtain with epitheliomas.

A malignant condition which proves much less susceptible to the action of the ray is mycosis fungoides. In the early stages this resembles eczema, with intense and persistent pruritus. Later, perhaps after several remissions, the nodules appear, and finally the large tumors. No internal or external treatment has proven successful in combating this affection. Radiation makes the patient more comfortable, and prolongs life, but the prognosis is uniformly bad.

The transition between malignant and non-malignant tumors is well represented by the precancerous dermatoses. The most frequently encountered of these are the seborrheic dermatoses. Age and exposure to sun and wind are important factors in their production. They are of three types: keratoid, nevoid, and verrucose; the keratoid being most apt to degenerate. These lesions may often be removed at an early stage by the use of a keratolytic, such as salicylic acid. At a still more advanced stage it may be necessary to follow the removal of the upper strata by the keratolytic with cauterization of the base with phenol or some other strong chemical caustic. Radiation usually produces a prompt and permanent involution of these lesions.

Among the non-malignant tumors the most frequently encountered group is our old boyhood friend, the wart. I am sure that

all of you are familiar, and have been since childhood, with at least one incantation method of treating warts. One method was to make the wart bleed, then rub a potato on the wart and bury the potato. Another was to spit on the wart, saying, "As I did not know where you came from, so should I not know where you go to." These techniques varied in different localities and I think that only old women were able to employ them successfully. At any rate, we have more reliable methods now. Where the warts are numerous the X-ray is our method of choice, especially in the newly forming and rapidly spreading types, three or four exposures usually being sufficient for a cure. Where the warts are not too hard and refractory, chemical cauterization is usually quite successful. Different operators use different agents. The most frequently used are carbolic acid, nitric acid, glacial acetic acid, monochlor-and-trichlor-acetic acid, chromic acid, caustic potash and caustic soda. We have employed them all and now use as a method of choice phenol and nitric acid. The wart is first painted with phenol; this is allowed to act for a minute; then a small cotton swab dipped in concentrated nitric acid is touched to the center of the wart. The carbolic acid does not tend to spread, but will usually remain where it is painted; it also tends to prevent the spread of the nitric acid beyond the area cauterized by the phenol; a further advantage is the anesthesia produced by the phenol, so that the nitric acid produces but little if any pain. A more rapid effect may be secured by puncturing the surface of the wart with a sharp-pointed tooth-pick, orange-wood stick or thorn which is kept moistened with the caustic. With all these chemical cauterization methods it may be necessary to repeat the procedure more than once; in fact, when we are striving for perfect cosmetic results we should not endeavor to remove the growth in one application. However, where the cosmetic result is of no consideration, where there is a desire for immediate results, or where the warts are hard and refractory to the chemical cauterization, other methods may be employed. Refrigeration, fulguration and electric cauterization are used; most operators seem to prefer the latter. Refrigeration is usually carried out with carbon-dioxide snow, but sometimes liquid air is employed. Fulguration is obtained by the use of a pointed metal electrode connected with the high-frequency apparatus. Our own experience with it has not been satisfactory, since we have found it much less effective than the electro-cautery, while practically as painful.

With the electro-cautery the hardest and largest warts may be removed in a few seconds. As a rule the resultant scar is very slight. The cautery should always be white hot, since less pain will be caused in this way than by a red heat.

Birth-marks are usually vascular nevi or angiomas. They appear early in life as a rule, but not necessarily at birth. Besides the ordinary type of vascular nevi, there are two other groups, the port wine stains and the cavernous angioma. In the treatment of the ordinary nevus the X-ray or radium may produce good results, but radiation is not free from the danger of telangiectasis. Carbon-dioxide snow is often effective, probably finding its best field here, but it is hard to control and may produce too much sloughing and scarring. Scarring may follow any of the methods of removing nevi. Since it is usually nevi on the face that we are called on to treat, we should choose the method which is least apt to produce noticeable scarring. Repeated light applications of phenol is most apt to give a good cosmetic result. In the deeper seated nevi it may be necessary to stipple the surface of the growth with punctures from a finely pointed wooden instrument dipped in phenol. It is much better to undertreat than to overtreat; better to take six treatments to get a perfect cosmetic result than to remove the growth in three treatments and leave an unsightly scar.

The port-wine stains are more refractory to treatment even though they are more superficial. Light cauterization is not nearly so apt to produce a cure. Radiation is probably the method of choice. Repeated light freezing is the method of choice by some operators. In treating the cavernous angioma we believe the injection of boiling water to be the most satisfactory method. This is done by heating a glass-barrelled syringe filled with sterile water to the boiling point and injecting the fluid while still hot. The syringe should be fitted with a small hypodermic needle, 26 or 27 gauge, and left in boiling water until the syringe and its contents are thoroughly heated. The syringe is held in a towel to protect the operator's hands. The point of the needle is introduced near the margin of the tumor and thrust into the tissue parallel to the surface. Sufficient water is injected as the needle is slowly withdrawn to blanch the tissue. Injection of fluid is stopped when the needle is almost out of the skin. The needle is again inserted in another part of the growth, and so on, until all or as much as is considered desirable of the area has been treated. This may be repeated at ten to fifteen day intervals.

Removal of scar tissue presents a difficult problem. Sometimes the scar can be excised and the skin drawn together in such a way as to present a practically invisible scar. In suturing the skin after scar excision, closure should be made parallel to the line of skin tension, rather than across it; the skin should be held where possible by cross strips of adhesive or by sewing together strips of adhesive fastened to the skin parallel to and on each side of the incision. Where these methods will not hold, a subcuticular suture may often be used. Broad cross straps of adhesive should be used to take the tension from the healing wound.

Keloidal growths present somewhat the same problem as the ordinary scar. Various methods are in use, but the best method in our opinion is the surgical incision of the keloid followed by strong radiation to prevent formation of scar tissue in excess anew. Both in small keloids and ordinary scars the use of ionic iodine may be tried. This is a procedure of value in many conditions and only too little employed. It consists of painting the area over the tumor with iodine, either the tincture of iodine plain or diluted with alcohol, and then driving it in with the galvanic battery. The patient holds the positive pole in the hand, the negative pole, a moistened sponge, is placed over the painted area. The current should be enough to produce mild tingling and should be allowed to pass until a large part of the iodine has been driven into the tissues, usually a matter of ten or fifteen minutes.

Lipomas and myomas are best treated by complete surgical excision.

The tubercular nodules and tumors of lupus vulgaris and tuberculosis verrucosus may be reduced by chemical or electrical cauterization, combined with radiation. Sometimes the use of the ray in these cases produces considerable irritation and the ultra-violet ray may be found more suitable. In treating with the ultra-violet ray it is necessary to have sufficient ray, which can not be obtained from most of the high-frequency apparatus used.

There are other skin tumors which might be included in this paper, if we cared to make it long enough, but these are the main ones, and the ones met with in the ordinary practice. In conclusion let me add this little saying as a guide in treating tumors: "Treat malignant tumors vigorously and radically; treat non-malignant tumors slowly and conservatively."

MALIGNANCY OF THE FACE AND JAWS.*

By FRANK T. FORT, Louisville.

Malignancy of the face and jaws is not unlike malignant disease involving other parts of the body; with one exception, i.e., where it is external it is exposed to view and in direct contact with the elements. The sufferer from such a malady is prone to postpone treatment from time to time: (a) in the hope the condition will finally right itself; (b) fearing operation would leave a disfigurement which it would be impossible for him to hide, or (c) that operation might cause the growth to develop with greater rapidity.

Of the various types of malignancy involving the face and jaws, the basal-cell is the least malignant form and may exist for many years without appreciable change. From microscopic examination one is unable to say to just what type the tumor belongs; only through careful study in a good microscopic laboratory can one determine with any degree of certainty the form of malignancy with which he is dealing. For this reason I believe a frozen section should be made in every case where an anesthetic is required, while the patient is anesthetized so the surgeon may be guided by the microscopic findings whether little or much tissue should be sacrificed.

In the small basal-cell type of epithelioma of the face, some form of paste, the knife, cautery, radium or the roentgen-ray is all that is necessary for its destruction. In malignant epulis, which is usually one of the least of the malignancies, in addition to enucleation of the main growth it is always necessary to chisel away diseased portions of the alveolar process. In cancer of the tongue, which is one of the most malignant types involving the mouth, metastases occur quite early and operation with hope for cure is best performed in two stages; that is, removing all the glands of the neck immediately connected with the lymphatics of the tongue, and excising the tongue. It is a moot question among surgeons which part of the operation should be performed first, excision of the tongue or extirpation of the glands; but the consensus of opinion seems to favor removing the glands first, and excising the tongue later; as in enucleating the glands of the neck the external carotid artery and its branches (the lingual and facial) can be ligated thereby lessening hemorrhage when the tongue is excised and pre-

venting cancerous tissue and blood from being aspirated into the lung, causing pulmonary abscess or bronchial pneumonia.

In excision of the lower jaw, where the bone is involved in malignant disease, the entire side of the mandible should be removed. If the case is far advanced the floor of the mouth with lymphatics may be removed and the mucous membrane of the tongue united to the skin of the cheek. Care should be exercised in avoiding the lower branches of the facial nerve which supply the muscles of the lower lip and angle of the mouth.

On account of the frequency of diseased upper teeth and the close proximity of their roots to the antrum, malignant disease often begins within the antrum. Where such a cancer is comparatively painless, it may be quite far advanced before being discovered by the family physician, and it may then be weeks or months before the attention of the surgeon is called to it. Cancer of the antrum may extend backward and the first evidence of it be a pouching within the mouth. It may grow outward, showing as a tumefaction on the face, or upward, producing slight exophthalmos with double vision. These cancers may metastacize in the cervical glandular region, or they may apparently remain in a quiescent stage except their continued development in size.

The writing of this paper was suggested by an advanced case of epithelial cancer of the antrum which came under my observation. The patient, a male aged sixty-three years, had noticed about six months previously that the left side of his face was becoming enlarged. He stated that at no time had there been any pain connected with the tumor; that he had suffered from toothache because of which all his teeth had been extracted several years ago and he had since worn a plate. He said that about four months before coming to me, his left eye had become "pushed forward," that he saw double and had very little control over the eye movements.

Upon examination of the patient I found no glandular enlargement within the neck, but there was a slightly sclerotic or diseased looking area of the gums on the left side where the molar teeth had been. There was a sinus in the situation of the first molar, leading rather upward and inward, into which a probe could be introduced one and one-half inches. The left eye was somewhat reddened and bulging, and the left side of the face showed a smooth, regular enlargement over the cheek bone.

After completing the examination, the patient was informed that he probably had carcinoma of the antrum, and in my opinion his

*Read before the Kentucky State Medical Association, Lexington, September 27, 28, 29, 30, 1920.

only chance of prolongation of life lay in operation; that statistics showed about fifty percent of cures where such cases were operated upon, and that there was absolutely no chance of cure without operation. He agreed to return for operation within ten days, which he did.

The patient was placed in the Sts. Mary and Elizabeth hospital, and prepared in the regular way for operation. I had Dr. Stuart Graves present at the time to make a frozen section and examine it microscopically. The anesthetist gave preliminary gas, later changing to ether. An aspirating apparatus was used to prevent any blood or other fluid from entering the lung.

After the patient was anesthetized I removed from the region of the sinus leading to the antrum, a portion of diseased tissue, about one-fourth inch deep and one-half inch long, which Dr. Graves examined and had a report to me within five minutes showing "epithelioma, squamous-cell type." I then felt no hesitancy about making the operation as thorough as possible. With two assistants, having the second assistant compress the facial artery on the left side, I made the Weber incision, which extends from the internal canthus around the ala of the nose to the raphe of the upper lip and through this into the mouth, and a second incision extending from the internal canthus around the infraorbital ridge to a point further outward on the face. The incision was extended downward to the bone and a flap lifted upward and outward, exposing the diseased area. The superior maxilla was extensively eroded just below the infraorbital foramen, there being a hole in it about one-fourth inch in diameter.

The soft tissues of the orbit were dissected from the floor and the internal oblique muscle detached. An aneurism needle threaded with strong silk was then passed through the speno-maxillary fissure, the silk being fastened to a gigli saw which was drawn through the fissure and the malar bone divided. The aneurism needle was then passed through the nasal process of the superior maxilla, the lateral nasal cartilage having been detached. My gigli saw broke while attempting to divide the nasal process of the superior maxillary, and bone forceps were substituted; then reaching into the patient's mouth with a knife, the soft palate was detached from the hard palate; the incision was extended along the raphe in the roof of the mouth and with a metacarpel saw the palate was divided, after which a chisel was placed in the cut parts of the bone and with a slight rocking motion the mass was mobilized; then

with a lion-jawed bone forceps, using a twisting motion, I extracted the whole of the antrum with a portion of bone within the diseased area.

The entire antrum seemed to be filled with the cancerous growth, which, to a certain extent limited the amount of bleeding. Gauze compresses were packed in the space to control the oozing; arteries which spurted were caught with the forceps and ligated. Most of the diseased area came away with the bone, but there was apparently some infected tissue left toward the outer angle of the excision. We had the cauterizing irons heated to a red heat, which we used rather liberally on this portion of the wound. The opening was packed with iodoform gauze so placed that it could be withdrawn later from the mouth. The flap was placed over the gauze and its edges coapted and sutured.

After forty-eight hours the packing was removed and thinking radium might be used to still further reinforce our attempt to destroy the cancer, I called in Dr. W. J. Young, who introduced two needles and one capsule, containing a total of about twenty-five milligrams of radium. The two needles were left in situ for twenty-four hours, and the capsule remained in the cavity for thirty-six hours. I had the patient on a back rest within a few hours after the operation, and he was out of bed the fourth day. The incision healed by first intention.

The "hyclorite spray" was used for cleaning the cavity, and solution antiseptics and other washes employed to keep the mouth clean. The dressings were changed twice daily. The patient was allowed to return home on the eleventh day, with the wound in his mouth granulating and filling normally. He has reported to me twice since first returning home, and the wound has apparently healed much more rapidly than I had anticipated; in fact, at the time of the operation, I felt that it was almost a hopeless case but was worth a chance. Six or eight weeks after being operated upon, to reinforce the other treatment, the patient returned to Louisville and about twelve milligrams of radium in a capsule were introduced at one point and allowed to remain for eight hours.

The patient was operated upon nearly six months ago, and from appearance of the site of enucleation, when last seen six weeks ago, I am inclined to think his life has been greatly prolonged by the operation. While I do not, of course, claim a complete cure has been effected, yet, considering the advanced stage in which I found the cancer, the condition would seem to warrant a similar operation in a parallel case.

Matas and Ahern advise ligation of the external carotid artery in excision of the superior maxillary; Taylor, of Dublin, and others advise laryngotomy; but I have not thought it necessary in any of the four cases I have seen to resort to either of these procedures, as they consume time; and time is an important factor, especially in operating upon elderly people. Use of the aspirating apparatus in connection with anesthesia prevents the gravitating of blood into the lung and lessens the danger of pneumonia.

I have operated upon a great many patients for cancer in various stages of development involving different portions of the body, and do not believe anyone can tell just what will be the outcome in any given case. As an illustration, I recall a lady, sixty-five years old, who had a cancer the size of my hand in the middle of her back at the dorso-lumbar junction, which, according to her statement, had been developing for fifteen years. She had not left the house for more than four years, and when I saw her she had gone to bed upstairs with the fixed determination of remaining there until she died. The odor from the cancer was so obnoxious that one could hardly go into the room, and I hesitated about asking one of the hospitals to admit a patient of that kind. I went to her home, "built a fence" around the diseased area with adhesive plaster, put vaseline around the base of the cancer, covered the growth with paste over which was placed tin foil, oiled muslin and vaseline, this application being allowed to remain intact for thirty-six hours. The paste was then removed and within a few days most of the cancerous mass had separated. After three or four weeks the are cicatrized and examination showed there was still some malignancy remaining. More paste was then applied which created a slough and further narrowed the cicatrix. After this cicatrix had been well formed, the skin wall outside of the diseased area was injected with novocain and all the scar tissue left from application of the paste was carefully excised. The skin edges were then brought together and sutured which would have been impossible had I excised the cancer at the first treatment. The patient recovered and is now perfectly well. I believe malignancy is as likely to develop in any other part of her body as near the site of the original trouble. No metastasis occurred in this case as the growth was in a region where there is less chance of metastasis than nearly any other portion of the body.

I believe the development of most cancers and their degree of malignancy bear a certain relationship to the site and their ability

to metastasize through the lymphatics which are more abundant in some portions of the anatomy than in others. It is not known just what produces cancer, but we do know that irritation seems to be an exciting cause, such as smoking, or broken teeth keeping the tongue irritated, the frequent picking at a small papilloma or mole, etc.

In closing I would like to voice the sentiment of one of the authorities in surgery, that inasmuch as the technique of dealing with cancer is conquered, if patients could be seen early enough the disease itself might be conquered.

DISCUSSION:

Louis Wallace Frank, Louisville: Of the various types of malignant disease which have been presented for discussion a sure method of cure is to get the case before cancer has developed. After it has become an evident cancer the results of treatment by surgery, radium and the X-Ray are problematic. It is the treatment of the precancerous lesion, excision of the old ulcer of the stomach, the eradication of the keratoses on the skin, the repair of the lacerated cervix, and the prevention of cancers in these places that offer the best results. This method or cure is almost certain.

In the treatment of cancer up to the present time nothing has developed that has taken the place of surgery, and, so far as we can see, unless we learn a great deal more about the use of radium in the treatment of cancer, surgery will continue to hold the most prominent place in combatting this disease. In radium and the X-Ray, however, we have two powerful agents to aid us, and used in conjunction with surgery better results are obtained than by a single method of treatment.

It is our experience that radium has its best effect on young cells or cells of the embryonal type, such as cells of the small round-cell sarcoma or of the basal-cell epithelioma. In such types of tumors radium produces very good results. The older the type of cell, the more developed it is, the more specialized it is, the more difficult it is to obtain results by the use of radium or the X-Ray. This is well illustrated by the effect of radium on the basal-cell epithelioma. In such cases one treatment, or two, as a rule will produce a cure in many cases. The prickle-cell epithelioma which develops from the horny layer of the skin is very difficult to cure with radium and the length of exposure must be greatly increased over that used in a similar basal-cell type of growth, and even then it may recur. It will take much greater exposure and longer time to cure the prickle-cell type of skin cancer. In this type of lesion it is our plan at present to give one treatment

with radium. If the growth reappears we then excise the tissue widely, with the subsequent use of radium over the region where the growth has been, and of the X-Ray in all glandular areas.

I want to speak of the use of radium and the X-Ray in tonsillar growths. We have had two cases, one of bilateral sarcoma of the tonsil treated last November which at present shows no evidence of the disease. In this case, which was lymphosarcoma, according to the report of the pathologist, one of the tonsils was about the size of a hen's egg and the other a little smaller. As just stated this patient is alive and well and shows no evidence of the disease. The other case was one of carcinoma of the tonsil. This responded very well to the first treatment with radium but later the growth increased and has since caused his death.

During the past three and a half years, or until six months ago, we had treated 59 cases of carcinoma of the cervix and corpora uteri. Of this number 27 cases are alive. Of the 59 cases there were 5 which were treated by surgery and radium combined. Two of these were operated after the use of radium. Both of them were distinctly inoperable at the time the radium was used, there being infiltration in both broad ligaments. One was operated a year after treatment with radium and, due to one of the unfortunate accidents of surgery, died shortly after the operation. The other patient is alive and well today. Of the 27 unoperated cases which are alive, 16 are well. Four of them have gone over three years, 5 of them have gone over two years, and 7 are well more than one year after treatment. These were all inoperable when first seen by us.

I would like to speak also of the results obtained by radium therapy in cases of fibroid and of myopathic uterine hemorrhages. We have treated quite a number of these cases with most excellent results. However, as the chairman has indicated that the time allotted me to discuss these excellent papers is expired I wish only to add that we hope sometime in the near future to present to this Association an analysis of our results of the cases treated during the past four or five years.

James B. Mason, London: I shall address my brief discussion to the use of the X-Ray. However, one cannot very well discuss the action of the X-Ray aside from that of radium. It has been shown by McKee and others that the effects of the two agents are practically the same. Each has some advantages in its administration, and each has some disadvantages. The chief disadvantage of the X-Ray was mentioned I think by Dr. Young. That is a question of technic, pure and simple. No man can cure malignancy, neither can he treat any of the

deep-seated conditions in which radium or X-Ray is indicated, provided he does not have the type of apparatus that will throw at least 100,000 volts of current through his tube and that tube back up with a nine inch spark gap. Your instrument must not show 100,000 volts passing through the tube and the tube back up a five or six or seven inch spark gap; but it must back up a gap that corresponds with the voltage. While we recognize the volt metre is not an accurate instrument, and we also recognize the spark gap is not an accurate method of testing the amount of current which is passing through the tube, yet these two things must in some way or other be worked out to apply to the particular type of each machine. You must have voltage passing through the tube that will penetrate tissue; and if you have, you will get results from the use of the X-Ray.

I do not think there is very much difference in results obtained from the two types of epithelioma when treated by the X-Ray. It takes more time to get results from one type than it does from the other; but if you will give them sufficient current you can get results. I believe McKee in his experience states that 95 percent of all epitheliomas coming to him without selection have been cured by the X-Ray. I do not want to make a wild statement, but in more than 60 cases which I have treated from time to time, and I have been thinking since I heard that paper, I can now recall only three cases in which I have not brought about a cure by the X-Ray. There may be others, but if so I have forgotten them for the purpose of this discussion.

Outside of epithelioma, I believe that all malignancies are surgical cases where they are operable. If unoperable, you give the patient the next best thing in the way of either radium or X-Ray.

My experience with radium has been limited to a few cases of uterine carcinoma, where the radium has been given by other men and the X-Ray treatments given by me. Those patients have all died. I have seen these patients made comfortable. One patient died a short time ago from an extensive carcinoma that seemed to involve everything in the pelvis. She died without hemorrhage or without pain.

In this connection it is well to mention the excellent results obtained in some of the more common skin lesions, acne, some of the chronic eczemas, and psoriasis in particular. It is a common experience to see some of these obstinate cases, after resisting other forms of treatment, very promptly clear up under X-Ray therapy.

John R. Wathen, Louisville: It is with some diffidence that I rise to discuss these papers. My own experience is limited to those cases I have referred to. Dr. Young for radium and X-Ray

treatment. I think we have passed the experimental stage to a large extent, but from my personal observation, it seems to me, that radium will do more good than the other agents. I realize in making that statement there are a great many men who take the opposite view. They claim the connective tissue is excited, and a large amount of connective tissue is thrown out; at the same time, the embryonic cancer cells are inhibited in their growth. In those cases that have been studied in serial sections, we have found the cancer cell embedded in a large mass of connective tissue. Whether these cancer cells are dead or not, is a question. I have felt that small doses of radium are like the incomplete surgery we have seen done in cancer of the breast. We become more radical, and if we would combat the cancer problem successfully, we have to deal with it in the precancerous stage, and we should resort to surgery at the earliest possible moment. After we have resorted to surgery, it is foolish to institute radium. Radium has many advantages over surgery and many advantages over the X-Ray. The principal advantage of radium in cases of cancer is its accessibility. It is easy to introduce a small tube of radium in the cervix of the uterus and let it remain the desired time. It is impossible to use the X-Ray in these cases, and they are so far advanced that it is impossible to do surgery. If there is any ray of hope in the way of cure, it seems to me it lies in the use of radium. I believe radium promises more today than surgery in certain cancers. In cancer of the breast we should resort to radical procedure and follow it with the X-Ray. It will penetrate over wider and deeper areas. Radium is especially suited for those cases where the field for its work is accessible, and where we can also place the radium tube or the emanation that Dr. Kelly, of the Johns Hopkins, uses.

In regard to the paper of Dr. Fort relative to cancer of the superior maxilla, I listened with pleasure two years ago in Baltimore to Dr. Bloodgood, who at that time described the technique with the electric cautery, using the hot iron and forcing the heat into the area involved. He reported a large number of successful cases treated in this way, and it seems to offer, in cancer of the superior maxilla, as much or more as surgery, radium, or the X-ray. I am strong advocate, therefore of the use of the electric cautery in the treatment of cancer of the jaws.

A. D. Willmoth, Louisville: This is the most important subject that has been presented to the Association for a long time. All physicians, whether they do one special line of work or another, are particularly interested in the question of malignancy. It was quite interesting to listen to the papers that have been read

this morning as to the remedial agent used for mitigating pain and relieving suffering and making the patients die in comfort. It is much better to keep clear in our minds the conditions Dr. Frank brought out, namely, the precancerous conditions. Personally, I believe that pathological conditions of the face, and particularly of the lips, of which we see so many cases, are much better excised very early in their beginning. In other words, all ulcers of the lips are open sores, and if they do not heal within five or six weeks an attempt should be made to excise them. All ulcers or sores that are recurrent in character, even though they may heal but break down again, should be excised. Personally, I believe that every cancer of the lower lip that is operated on by any one should first have the glands removed in the neck. I believe that a man is just as guilty of criminal negligence who removes a cancer of the lip by the old V-shaped incision, or any other incision, and leaves the glands in the neck, as would be the man who removed a marked cancer of the breast and left the glands under the arm.

In Rochester, which so many are pleased to term the Court of Last Resort, they have determined that fully 97 percent of all cancers of the lower lip will be permanently cured, provided you remove the glands and the fascia in the neck before the growth is removed from the lip, making that the last part of the operation. If you do not do that, your percentage of cures will drop down to about 37. It is, therefore, very important that these growths be excised early and radically, and that the gland, the periglandular structures in the neck be also removed at the same time.

R. C. McChord, Lebanon: There is only one phase of this subject I wish to discuss. I have heard very little said about the use of heat in these cases. I am a great believer, especially in these inoperable cases of cancer of the cervix, in the use of heat. I believe we get more benefit from the use of extensive heat in the treatment of inoperable cases of cancer of the cervix of the uterus than we do from any other source, if it is done radically.

A great many women come to us who have large families; they are modest women who have allowed these troubles to go on until they report to us and then we find their cases inoperable. What are you going to do with them? They are beyond the stage where we can do a radical operation with the knife. Are you going to turn these women loose on the world with morphin and the hypodermic syringe and do nothing for them? They come to us with the tissues broken down, they are bleeding profusely, and we must do something for them. In these cases I do not depend upon the electric cautery, but the old-fashioned soldering iron. I practically cook the

part, and in doing so stop the suppuration, and pain. In four or five days these women, who were bedridden previously, are able to be up and around. By such treatment you have given them a chance to live in comfort.

The greatest trouble is to get them to have the operation renewed whenever their symptoms recur. If you are candid with them, you can tell them there is some hope of temporary relief, and that relief I can obtain better in a shorter time by thorough cauterization than by anything else, and I believe it is our duty in these cases, particularly if the disease is advanced, to go in there and practically destroy the uterus, and sometimes get cures, but very rarely.

The worst case of cancer of the cervix I ever saw was one in which I cauterized the uterus years ago, and that woman is the handsomest woman in our town today. This was a case in which the growth occurred rapidly, and was exuding. Occasionally in such cases we get favorable results.

Arthur T. McCormack, Louisville: From the standpoint of public health, we are constantly impressed that the high death rate from cancer is increasing. There is but one remedy, that is to keep clearly in mind Dr. Frank's suggestion, that these women must be attended while in the precancerous stage if we are going to get anywhere. That cannot be done except by the general practitioners who see these patients first, and it cannot be done even by them unless they see these patients earlier than they are seeing them now, and one of the most important things before the medical profession of Kentucky is to go before church societies, women's clubs, before any kind of gathering, and tell them about the importance of being treated while there is time to get relief. You can only get that kind of comfort in cancer in its last stages that you get in watching the patient die. That is poor comfort. In the early stages these conditions can all be relieved. In this connection I am reminded of what John Wesley's mother said when Wesley's father said to him: "I have told him the same thing nineteen times in three days," and Mrs. Wesley said, "Why in the world are you repeating so often the same thing?" "Because," he said, "He didn't know it the eighteenth time." The cold statistics in Kentucky indicate that the people and the medical profession do not know yet and have not the courage to say to the people that this condition is likely to become malignant and needs to be relieved now while there is a chance to afford relief, and not wait until it becomes malignant, and unless it is operated immediately, unless something is done immediately by an expert who knows how to deal with the condition it cannot be relieved. It is important to examine patients carefully

and thoroughly and send them, if necessary, to men in whom we have the most confidence. That is the only way to reduce the death rate from cancer which is increasing in Kentucky.

Louis Frank, Louisville: I think the last speaker, and in fact the last three speakers, have probably touched upon very important points. It is a very sad commentary, although it is absolutely true, that cancer, as the surgeon sees it, is practically always in the terminal stage. If we will study the reports of the recoveries after five years in cancer of the breast, in cancer of the stomach, in cancer of the cervix, I believe we will all come to the same conclusion that the surgeon sees it in practically the terminal stage. There is no reason why our results should not be as good in these localities as they are with cancer of the lip when block dissection is done, and you have been told what the results in this class of cases are. Women are proverbially modest, and they still hesitate in consulting their doctor, and their doctors hesitate about examining them, and they delay consulting the surgeon, and as a rule, therefore, in the breast and uterus we see cancer very, very late.

In cancer of the stomach, I will have to repeat what I have said on many occasions, that these patients are even yet examined without ever disrobing them, and the vast majority of them are treated for indigestion for a number of years during the ulcer period, and even during the carcinoma period, and again we see them in the very last stages. The vast majority of cases of cancer of the stomach which I personally see, even if operated on, are practically hopeless, they have progressed so far. Many of them are not opened for exploratory purposes.

With reference to the curative value of the various agents that have been mentioned and of the topics which have been directly under discussion by the essayists, I am in accord with what has been so forcibly impressed by one or two of the speakers, namely, early operation and wide excision. Why delay? There should be extensive glandular removal by block dissection of all glands, draining the infected area. That is an important point which must be borne in mind, and we believe that it is best to take the glands first, beginning the operation above and cutting down, and in the lower jaw, getting out the glands before taking out the disease itself, doing the operation in two stages if need be.

There are a great number of patients whose cases are distinctly inoperable. What shall we do for them? Are we going to dismiss them? In the X-Ray, in radium, and with the hot iron we have agents at our disposal which at times give absolutely phenomenal, almost miraculous, results. In our cases of cancer of the cervix, treated with radium, absolutely inoperable, (some

of them have had their abdomens opened, demonstrating the extensive glandular involvement), we have had some results that are absolutely unbelievable. We make it a practice of treating our operative cases with radium for additional protection, and in the breast we resort to the X-Ray for additional protection. We are of the opinion that there is a distinct advantage in "X-Ray blocking" previous to operation, and much good post-operatively in the abdominal cases from "cross firing."

W. J. Young, Louisville: (closing on his part):

I want to thank the members for their liberal discussion. They have taken up the subject thoroughly. There is only one thing I have to say about radiation before operation, namely, it is not done generally, but it is a thing I consider very important, especially in cancer of the breast. It is always well to ray all avenues and metastases, simply raying where there is any possible metastases that might occur before the electric cautery knife is used.

Frank T. Fort, Louisville (closing): I believe I have derived more benefit from this very free discussion than from the papers themselves.

I made a mistake in my paper, my attention having been called to it by Dr. Young. I stated that when you get an old man on the table and have him anesthetized and wait for a report to come back you think it is ten minutes, when it is only five minutes by the clock. I want that changed in my paper before it is published.

I think all agree regarding the point I brought out in the latter part of my paper, namely, that if these patients could be seen early enough, our results from treatment would be better. If these patients can be seen in the precancerous stage, first finding out the type of case, and then doing a wide dissection, taking out the glands first, and then doing a radical operation, even if it is simple in its appearance, the results are much better.

Pericarditis with Abdominal Symptoms.—In one of the cases cited by Holden the symptoms manifested led to a diagnosis of perforating ulcer and immediate laparotomy was done. The abdomen was negative. Two days later positive signs of pericarditis were present. Necropsy revealed purulent pericarditis. In the second case a probable diagnosis of appendicitis was made and operation advised. Laparotomy revealed a normal appendix. Twenty-four hours later a marked pericardial friction was present. The third patient had been sick one day with abdominal pain, tenderness and rigidity, fever, leukocytosis, urine negative, chest and heart negative. Symptoms and signs pointed to trouble below the diaphragm. Operation found a normal abdomen. Two days later pericarditis and endocarditis were unmistakably present.

FOLLICULAR AND PERI-FOLLICULAR URETHRITIS WITH SEQUELLAE. *

By J. G. CARPENTER, Stanford.

To do justice to the subject, Follicular and Peri-Follicular Urethritis, it behooves us to first consider certain anatomical truths in regard to the normal male urethra; viz: The normal size or calibre of the average meatus is 27 millimeters; the urethral fossa navicularis of glans penis is about 30 millimeters; the normal size of the urethra is about 322 or 33 millimeters. A penis that is three inches in circumference in its flacid state has a urethral calibre of 32 millimeters; for a circumference of 3¼ inches the calibre should be 34 millimeters; 3½ inches in circumference, the calibre should be 36 millimeters; and for 4 inches the calibre should be 38 millimeters, and so on. I have seen two urethrae of 45 millimeters in calibre, and have seen a number of urethrae 40, 42, and 43 millimeters in size and they had one or more strictures of large size measuring from 25, 30 to 38 millimeters. Many patients with strictures of large calibres or large size, suffer from various urinary difficulties, viz: frequent urination, forked stream, cork-screw stream, irritability and spasm of the bladder, dyspareunia, tingling sensation of the urethra, like worms crawling in the urethra and neck of bladder; neuralgia of bladder, penistesticles and rectum; orchitis or prostatitis, and a constant fixed pain in the hypogastric and lumbar regions and along the anterior-cruar and sciatic nerves, and often become neurasthenics from the chronic irritation produced by strictures of large calibre in the urethra. Strictures primarily, according to Professor Otis, may be divided into strictures of small calibres of 18 millimeters or less, and large calibres, 18 to 40 millimeters, and it is often the case that strictures of large calibres give rise to most of the above subjective disturbances, causing dyspareunia or difficult and painful sexual intercourse. One male patient complained of a hot, burning pain in the rectum; another of the increase of pain in the hypogastric region; another of increase of pain in the lumbar region and head of penis during ejaculation of sexual intercourse; and others of increase of pain in the genital plexus; the anterior cruar and sciatic nerves and palpation of the heart of great severity during sexual act, and were afraid to have sexual intercourse on account of the mental and physical distress and ag-

*Read before the Kentucky State Medical Association, Lexington, September 27, 28, 29, 30, 1920.

gravation of subjective symptoms, previously mentioned, and were "cowards and slackers" in the performance of normal, legal sexual intercourse in holy wedlock and lamented sowing their "wild oats" in previous years; and like King David would exclaim, "Man born of woman is of few days and full of trouble, or, that a man in his youth is as prone to evil as the sparks are to fly upward," and when cured of gonorrhoea, urethral structures, gleet, follicular and peri-follicular urethritis with abscesses and urinary infiltrations of corpora cavernosa, scrotum and perineum, are ready to exclaim, when restored to a "normal status praeservis," "Whatsoever a man soweth that shall he also reap," and "No fornicator, adulterer, or whoremonger shall ever enter the Kingdom of Heaven," and sing, "We would rather be a doorkeeper in the house of the Lord, than place confidence in man; that without holiness no man shall see the Lord." The essayist desires to state that he has had no personal experience with gonorrhoea, urethral strictures, follicular and peri-follicular urethritis, abscesses and infiltration of the urino, and he has only had a professional experience and has had large clinical fields to observe and study in his private practice, and in that of other specialists in this line, in Louisville, Danville, St. Louis, Chicago, Philadelphia and New York City. The only accurate way to measure the calibre of the urethra is with Otis Urethrametre and Otis Bulbous olive pointed urethral sounds. Otis Urethrametre measures urethral strictures 18 to 45 millimeters in size, and the olive pointed sounds measure strictures of small calibre, 8 millimeters in calibre to 40 millimeters in size. Otis dilator urethratome will measure dilate and cut urethral strictures to 45 millimeters, the normal calibres of some few urethrae; and Otis sounds dilate to 40 millimeters. The germs of the most virulent types of gonorrhea I have been professionally acquainted with have been those produced, reproduced and grown in Louisville and Danville, Kentucky, and New York City, and produced the most violent and disastrous consequences on the patient and penis.

We must know the anatomy, physiology of the urethra, its normal calibre and have the instruments of precision, mathematically annotated for accurate diagnosis and treatment before we can appreciate and know the morbid anatomy and pathology of urethral diseases and their sequellae and complications, and successfully diagnose and treat urethral diseases and cure our patients. We must diagnose by inspection, palpation, mensuration, instrumental diagnostic touch; the instrumental

"tactus eruditus;" intra ocular inspection with the urethral endoscope to crown our efforts and treatment with success, and get a golden crown; treat your patients C. O. D. on a sound money basis; but unfortunately for the surgeon, many of these patients are impecunious in the ratio of sixteen to one, therefore make them pay in advance, on a sound money basis, or get a note with good security, for after the services are rendered, patients cured and dismissed, you will have great difficulty in collecting your debts in venereal practise. And unless you collect in advance you may say, God and the doctor they all adore, just on the brink of danger, not before; the danger past, a cure made, both alike requited; God is forgotten and the doctor is slighted.

The most common cause of urethral stricture is a gonorrhea; gonococcus infection; the most frequent cause of follicular and peri-follicular urethritis is chronic gonorrhea with one or more urethral strictures plus a staphylococcus and streptococcus infection attended with one or more abscesses of the corpora cavernosa, one or both sides of the penis; abscesses of the pre-scrotal tissue, the scrotum and perinaeum; with follicular and peri-follicular urethritis there may co-exist a sub-acute gonorrheal inflammation which has to be subdued before giving the patient curative surgical treatment for the strictures for a permanent cure. The follicular and peri-follicular abscesses have to be incised, antiseptized and drained and treated with antiseptic washes and dressings and rest, and the necessary local and constitutional treatment for the betterment of the patients, and cure of penis and patient with Otis urethremetre and olive tipped sounds, the surgical diagnosis, the location of the stricture, its size, how far from the meatus and how many strictures exist; whether annular, lateral, tortuous strictures are present. Subdue all acute and sub-acute urethritis by treatment before beginning instrumental treatment for the cure of the stricture or strictures; gradual and timely judicious divulsion under local anesthesia and twilight treatment with thorough antiseptics at stated intervals will cure the strictures and chronic gonorrhea or gleet supplemented with antiseptic treatment. The urethral and peri-urethral folliculitis, with or without corporitis of the corpora cavernosa or corpus spongiosum may end in resolution without the formation of an abscess or multiple abscesses and urinary infiltration under antiseptic soothing treatment and rest. Should abscesses or multiple abscesses form, incise and drain, under antiseptic treatment as in abscesses in other parts of the body, the ure-

thra should be dilated for the cure of the strictures every other day, or twice a week for two or three to several weeks and once or twice a month for several months. In many cases, each case being a law unto itself, as to when dilation should be done and how often it should be done; with the old hard, dense fibrous strictures, an internal urethrotomy with dilation may have to be done to cure the patient and relieve the sequellae. Sixty-five per cent or more of all women who have to submit to life-saving abdominal and pelvic surgery for tubal and ovarian diseases, do so on account of gonorrhea in the husband or some other fellow. Therefore, to have gonorrhea or syphilis is a crime, is a crime. Those having syphilis or gonorrhea should be quarantined and held in quarantine until cured; and when ready, be returned to society in a normal state. That a health certificate before marriage should be demanded by both parties before marriage is made, is a self-evident proposition.

Corollary; live pure, virtuous, healthful lives, free from gonorrhea, chancroid, syphilis, urethra stricture, and a long tight foreskin, then you will be happy, live happy, die happy, but you may not have much fun. In conclusion, remember, a judicious meatomy the size of the normal urethra is often very essential for the introduction of the proper size urethral sound or dilator, to keep the stricture stretched to the normal size of the urethra, for the meatus is more apt to contract, lessen its calibre, than any other portion of the urethra. Again, a tight prepuce is a great hindrance to the proper and successful treatment of a urethral stricture, therefore, a tight prepuce is unsanitary, is a nuisance and it is always in order and legal to abate a nuisance, therefore, circumcize freely every case that needs the operation for health, symmetry, aspect and beauty, that the best interests of the Commonwealth may be maintained, and the pride and joy of life may be upheld, and manhood may be honored and dignified and glorified. These strictured patients, when well, seek religion, attend the Sunday Schools, join the church, eventually marry, live pure lives and make good citizens.

On the proximal side of the stricture, the mucosa of the urethra is discolored and extra red or purplish red, or livid; extra sensitive and tender, and one or more drops of residual urine are retained after urination; undergo decomposition; irritate and inflame the urethra and if infected with the staphylococcus and streptococcus germs, abrasions of mucosa occur then. Urinary infiltration with abscesses of the corpora cavernosa

of one or both sides of penis, prescrotal tissue and perinaeum will result, involving one or more or all of these tissues and regions.

DISCUSSION:

Leon L. Solomon, Louisville: Dr. Carpenter has often shown himself to be a scientist, as he appears in our discussions; until today we did not know him as an artist; behold his drawings!! As a philosopher and Biblical scholar, he is well known to us; to sustain his position, he quotes literally, scripture. Finally, he has impressed upon us the fact that he is a financier in the practice of medicine, telling us that there are certain patients from whom we will never get our fee, unless we follow his plan and get it all, in advance. To take care of these patients, we must arrange in advance to take care of ourselves. The serious word of this paper is the fact and lesson, which we ought all take home with us. It is this: God Almighty, from the top of Sinai, handed down through Moses, the Commandment, "Thou shalt not commit adultery." Pity it is, so many of us poor mortals disobey the command. Among all the departments of the practice of medicine, none is more important and dignified than that of genito-urinary diseases. I am sorry that more of this branch of the profession are not present today, to hear and discuss this last essay of the meeting. What I am going to say, may be said without fear of contradiction. In years gone by, for the most part, genito-urinary specialists, to whom patients went for treatment, have, with few exceptions, been men who have looked upon syphilis and gonorrhea with levity. Infrequently, then, they were representative of that truer idealistic type, which we more frequently meet today. Dr. Carpenter's paper appeals to the nobler type, who have come along in later years. His is an appeal to the consideration of the subject in its true light. I have said to some of my audiences, when it was my privilege as a Director of the Venereal Disease Bureau to address them, that I would as soon put my hand and arm in molten metal, up to the elbow, as to introduce the external genital into a disreputable female. And yet, how many doctors look with equanimity on this subject, and how few members of the profession have been sufficiently serious about it, to speak out their sentiments so as to appear decently in public print.

I recall in the days of David Yandell, when women with chaneres, (or chancroid) and women with gonorrhea were presented by him at the old U. of L. Clinic; it was not uncommon, especially where the woman had physical charms, for members of the class to make engagements with these creatures, indulging themselves sexually.

Now, for the first time in the history of the

world's government—our government—the United States of America, purposes to eradicate the venereal diseases. It is the first national government, I believe, that has provided money with which this work shall be done.

Dr. J. N. McCormack asked me to serve as Venereal Disease Director, an office which I had the honor to fill, without cost to the government or to my state, from the inauguration of the work, during the war, until I resigned in favor of my successor, Dr. Milton Board, December 31, 1919. The Bureau offers to the poor and indigent, treatment free of charge. It does not propose to pauperize the public at large, and deny legitimate practitioners the right to exact or demand a fee. As Dr. Carpenter has truly said, from many of these patients the fee must be had in advance or none will be had, thereafter.

The paper just presented is a most excellent one. It is to be hoped that those who have heard it will assist Dr. Board, Director of the Bureau of Venereal Diseases, in his work. E. R. Palmer years ago remarked, "The world is rapidly becoming syphilized."

Dr. John W. Scott, Lexington: I want to heartily second what Dr. Solomon has said and to emphasize what I consider is of prime importance to men who are handling this kind of work, namely, to do it in a dignified way. I do not think there is anything more disgusting than to see one who is taking care of venereal disease treating the subject with levity; I do not mean without a certain sense of humor. I have some idea of humor, I believe, but I cannot appreciate the point of view of one who treats such cases as a joke. To my mind it is perfectly incomprehensible. It is essential for the genitourinary man to have a high sense of propriety in this respect, and his personal conduct ought to be like that of every physician, beyond reproach.

I think this propaganda against the venereal diseases is one of the most essential causes the medical profession can further. To my mind the combatting of prostitution is the prime factor in preventing the spread of venereal disease. Many of the leaders in the profession have given this subject much time and attention. The American Social Hygiene Association has been led by men of the highest type in the profession. Dr. E. L. Keyes, of New York, was for a long time President of it. Dr. Hugh Cabot is one of the leaders in the work, and I might mention others, and it is certainly something that is recognized and appreciated by every man who has sense and gives any real thought to the subject. I believe the way to prevent the spread of venereal disease is through the suppression of prostitution, fighting it every time it shows its head, and

never willing to assume an attitude of complacency in regard to it.

J. M. Morris, Berea: I must say that some of the best things I have heard have been held back to the last. I think many of the members have been quite free in commenting on Dr. Carpenter's splendid paper. This is a broad subject and one of vital importance to every man, not only in the medical profession but to every man and woman in this country and of other countries.

With reference to one thing Dr. Scott said, I fully agree with him that we must fight prostitution. That is a good thing to do, but we must remember that from time immemorial, sexual intercourse has been going on among the people, and with the propaganda of ministers and preachers, and social workers, it is going on still. The wise and necessary thing to do, in my judgment, is to establish in every city and every state in this country prophylactic stations. You know that sexual intercourse was indulged in by a large number of men during the world war, and of those who came in and took prophylactic treatment after sexual intercourse, less than one-half of one percent became infected after known exposure. Let us fight the evil both ways. The gonococcus is a little devil when you see him and stain him and look at him under the microscope. His home is usually found in the male urethra, and when he is once lodged there he is perfectly satisfied, and he goes on to carry out that commandment handed down to us years ago, "Be fruitful, multiply and replenish the earth." In other words, he multiplies and replenishes himself. He has become satisfied there. Most men between the ages of 18 and 25 may have no vices of a general nature except they have the gonococcus in their urethras.

Dr. Carpenter has given us a splendid paper. I think we should make a fight both ways. We can establish prophylactic stations and we can teach people from a sane and safe standpoint that the evil will go on if they do these things. These things ought to be taught in the pulpit and in our schools and colleges and everywhere else.

Arthur T. McCormack, Louisville: Dr. Carpenter never presents a paper without furnishing food for thought, and he always develops a sense of responsibility and leadership in the profession that you would expect a man to do who has had his varied and vast experience and has exercised the leadership he has so long shown in a large section of the state.

The problem of venereal prophylaxis is as old as the world, but it has never assumed greater seriousness than now, owing to our improved methods of communication. The man in the lowest recesses of the mountains is closer to the

disease district of our towns and cities than he ever was before.

Surveys of the prostitutes in all parts of the world have brought the same results. In Ashland recently 17 prostitutes were brought into the jail and examined, and 17 of them were diseased with syphilis or gonorrhea in the communicable stages.

In New York a series of examinations extending over several years in many hospitals, comprising thousands of cases, as a routine showed infection of 25 percent of the cases examined for syphilis. They had positive Wassermanns. These cases were not selected because they had syphilitic symptoms. Examinations were made as a routine.

In Panama, investigation extending over twelve years showed 34 percent of the people in the Ancon and Panama Hospitals were found to be infected with syphilis where every patient was examined for that disease. In an examination of a thousand prostitutes there, 32 were found to be apparently free from disease at the time of the examination. Recognizing these facts, understanding venereal diseases were six times as frequent as recognizable tuberculosis in our draft Army; understanding that the surgeons tell us that somewhere between 75 and 90 percent of abdominal operations on women for diseases peculiar to their sex are due to gonorrhea; appreciating what the alienists say when they tell us our asylums are at least half filled with the results of syphilitic infection, either in the parents or the grandparents or the individuals themselves, the medical profession must realize the seriousness of the matter, and the people must be made to realize it also.

There are two methods of approach to this question. First, preventative medicine. We have been trying for a long time to induce people to come to us to be treated as long as they will continue to take treatment, and that is an admitted failure. It does not do any good so far as lessening the incidence of the disease is concerned. It has very little effect on the problem. We treat all cases of gonorrhea and syphilis as long as they come, and we treat them long enough to be comfortable, and they develop an aftermath of the disease and become incurables later in life.

We have to recognize the facts as they confront us. We have the best people in the world, but when we grade them so far as information and knowledge goes, they rank extremely low. Our educational system graded by the educators of this country ranks 46 in the list of states, and if you sow of ignorance you reap the harvest. We have not the soil upon which to plant the facts we know, and I believe the last legislature in passing the physical education law, which means children must devote thirty

minutes of each day to physical education, started that enlightenment that is absolutely necessary if we are going to get rid of these diseases. We have more venereal disease in Kentucky than in states which have real educational systems. Charts drawn show almost in parallel columns that Massachusetts was the lowest in venereal infection. Massachusetts has a polyglot population, all of whom are not worth one county of Kentuckians. If our people were given the opportunities and advantages of education as the people in Massachusetts, much good work could be done; yet we are permitting our children, our men and women to be sacrificed before the alters of Moloch, and we need to pause and study more carefully means of relief. We want to relieve all the cases we can.

Personally, I believe as Dr. Morris suggested, in making prophylaxis available.

Pennsylvania has done a wise thing in that its state health department has provided in every drug store for prophylactic packages, sold for five cents. It is the best thing that can be done under the circumstances, but I believe it is but a temporary expedient that should only be utilized until we have become sufficiently enlightened and learned enough to properly understand these matters and properly control the race. I do not believe propagation of the species is going to be stopped. I do not believe that the time is going to come when we will continue to have less children in the mountains of Kentucky. There are fewer births than deaths in most other sections and if it were not for the constant increase in the pioneer sections of our state, we would soon have no population of our own. These matters are tremendously serious, and if the people understand them, if the people know them and we can give them a foundation of clear knowledge, eventually the problem will be solved right. It cannot be done in a minute. It is a campaign that will take the rest of the human race to solve correctly, but it is our duty as individuals to give as much of our time and as much of our influence as possible, and to that end the State Board of Health asks the serious aid not only of every doctor but of every citizen in this campaign. This is one of the greatest problems of the age when it is finally solved, and in so far as we can we must solve it for each individual man, woman, boy and girl, and free them from the thralldom that has afflicted so many and that has destroyed so many. (Applause.)

Roscoe S. Plumlee, Smiths Grove: One of the greatest sources in my mind at present for information concerning this serious disease should be considered by the parents first. Home is the place to begin improvements in civic reform. Let us lay aside false modesty and as the girls arrive at the proper age in this respect, take

them to the fireside, sit down with them, and discuss these matters frankly with them. There is one place where I feel greater responsibility to work than in any other place, and I imagine there are other parents who feel the same. A number of mothers are members of ladies' aid societies, civic reform clubs, and 20th century clubs, and they should carry into these societies these subjects and discuss them there by virtue of the information that they receive at the hands of their family doctors, and there is my hope of partial reform.

S. F. Keffer, Ashland: There is one feature of this discussion that has not been mentioned. A man can be a perfectly healthy man without having sexual intercourse. It is absolutely detrimental to a man's health to chase after prostitutes. We ought to begin in our own homes and see that our boys and girls are properly trained in regard to sexual matters. I venture to say that 90 percent of all the blindness in Kentucky is the result of the sins of parents before or after they were married. If we have been given healthy bodies, we should certainly try to pass them on to our children. That is one of the things I have thought over a good many times. My father has often said to me, "My boy, I want you to so live that you will have a sound and healthy body, and not have syphilis or gonorrhea in your system." If we have boys and girls we can teach them and point out to them the evils of gonorrhea and syphilis.

During the war there were a great many men who put in more days in the hospitals of the Army than in the field, and I think any Army surgeon will bear me out in that statement.

Every recruit in the Army had to attend lectures on venereal diseases, and that was one of the best things that happened to the boys. We can teach our own boys. If you have a son you want to be worth something, teach him and your neighbor's boy the same way.

There is one other thing I wish to speak about. We have to raise babies or some other people will inhabit this earth of ours. The parents who raise one child are not advancing. It has been figured out that in each family there should be at least four children. You take the foreigners who come to this country, work for a dollar and a half a day, they raise from six to ten children or more if they can. If we have only two to four children in our families, in time they will be outvoted by the foreigners who are brought here and take their places in this country. The City of New York is not an American city any more; neither is Boston. There are more children born of foreign parents than of native born parents, and the same condition may come in Kentucky sometime unless measures are taken to increase the birth rate.

Dr. J. G. Carpenter (closing the discussion): I

form a companionship with the boys. I have two sons and two daughters, and I make companions of my children. I talk to my children about these things and I teach my neighbor's children. In fact, I sometimes preach on this subject to the people in the county, and I believe I get more confessions made to me than to the all time health officer, or preachers or priests. I have talked on these subjects in so many places that I am a preacher and people come to me instead of going to the preachers and divinity doctors for spiritual advice. I keep in close touch with the boys, and I am going to show these pictures in connection with my lecture. I will lecture in any place in my county where I can get a crowd of men from 16 years of age up. I believe in teaching boys morality. I teach them that circumcision is a health measure; that it prevents balanitis and gonorrhea and syphilitic infection. I believe the sexual organs ought to be dignified and glorified, and that men must take as much care of their sexual organs as they do of their teeth and rectum.

The question is often raised as to how long a man can continue to have sexual intercourse. I believe that men who have been free from gonorrhea and strictures or syphilis may continue the sexual act up to 85 or 90 years of age. This is a physiologic fact. A man 90 years of age came to me and said that his sexual apparatus was wrong. I thought he had prostatic trouble and I said to him, "you probably have some prostatic disease." He said his sexual power was declining. Last year he had been copulating twice every eight days, and now that he is ninety years of age he could not perform the sexual act but once in ten days and wanted something done to his sexual organs. I told him to sit in the shade on ice; after his name wrote quantum sufficit. If men lead pure, straight upright lives, their sexual powers will stay with them during a lifetime. Be pure in thought, act and deed.

I believe people infected with gonorrhea and syphilis and chancre should be kept in quarantine as by these presence we shall know them. They have no more right to be at large than a case of diphtheria or small pox. They ought to be quarantined until free from danger and infection, and then they should be allowed to return to society.

I have done a great many abdominal sections as a result of gonorrhea. I hope the time will come when the average husband will be so pure that his wife will not have to submit to an abdominal section, much less have ovarian disease, or give birth to a child of a gonorrheic husband, with gonorrheal ophthalmia.

LOCAL VERSUS GENERAL ANESTHESIA IN TONSILECTOMY.*

By R. H. COWLEY, Berea.

The subject of this paper is not intended to convey the idea that there is a conflict between the local and general anaesthetic methods of operation in Tonsilectomy. The object of the paper is rather to point out the advantages of each method and to start a discussion which will help in deciding the method to be selected in any particular case.

The objects to be attained by any method of operation are: First, safety; second, a clean, neat job which removes all of the tonsil and leaves the throat with pillars and palate intact, and all parts as near normal as possible. Third, as pleasant an experience as possible for the patient.

Safetly is without doubt the most important consideration. Any operation, however easy and clever it might be, would have to take second place if it were accompanied by any considerable element of danger.

The dangers from tonsilectomy are four:

First—Hemorrhage.

Second—Aspiration pneumonia.

Third—Local infection.

Fourth—Death from Anaesthesia.

I do not think that it can be said that either method has any particular advantage as regards hemorrhage. Hemorrhage is to some extent a matter of accident, but to a much larger extent a matter of technique. If absolutely all bleeding is controlled before the patient leaves the table and the fossae are left clean and dry there is little danger of subsequent hemorrhage. If the vessel is blocked by a loose clot which may easily be dislodged by the action of the throat muscles in swallowing, there is likely to be post-operative hemorrhage in any case. Personally, I can pick up the bleeding vessel and either crush it or tie it off easier and quicker when I am operating under local, but I know some men who are lots better operators than I am who prefer the general anaesthetic in this regard. It is only during the last year or so that I have been able to control hemorrhage satisfactorily in these cases and it might be of benefit to some one here if I should describe the method I now use. I always have at hand three large pedicle clamps which have great crushing power at the points. After the tonsil is removed, the pillar is retracted and with small round sponges made especially for this purpose,

the fossae is patted clean. The bleeding point is then easily seen and is caught by the clamp which is closed tight. If it is left on a few seconds the tissue is so crushed that the bleeding is usually stopped. If when the clamp is removed the bleeding persists, the clamp is replaced and the vessel tied. For this purpose No. 2 plain catgut is used and only a single knot tied. Thus

Before using this method, hemorrhage was a terror to me and I was called back to stop bleeding in too many of my cases. In the 150 cases which I have done since using this method I have been called back once, and in that case the bleeding had stopped before I arrived. So hemorrhage has lost most of its terror for me. However, this method is about equally applicable in local and general anaesthetic work and there is little choice between them as regards hemorrhage.

Aspiration pneumonia is indeed a very serious but, I judge, a rather infrequent complication. I have never seen a case of it following tonsilectomy, but if it does occur it is surely more apt to follow operation under general anaesthetic. Some writers say that this is due to the ether pumps which are in common use and which are supposed to drive the blood and pieces of tonsils down into the trachea. This theory seems rather fanciful when one considers the fact that the ether pumps produce scarcely any pressure and could not possibly force things into the trachea. When one thinks how the throat sometimes fills up with blood, vomit, and what not, the wonder is that aspiration pneumonia is not more common after all operations with general anaesthesia. Surely if there is any choice in regard to this complication it is in favor of the local anaesthetic, for here the patient is perfectly conscious all the time and no particle of blood or mucous is breathed into the trachea.

In regard to local infection, there is probably somewhat more danger from the local method. Most of the infections, of course, come from the organisms already present at the time of the operation and should occur as often with one as with the other method, but with the local method there is the added danger that some of these organisms will be carried deep into the tissues when the anaesthetic is being injected. I do not know how often this occurs but I have had two such cases in my experience with the formation of local abscesses which had to be lanced and which prolonged the convalescence a few days but did no other harm.

In regard to the danger of death from the anaesthetic, the facts are all in favor of the local anaesthesia. There may be very little

*Read before the Kentucky State Medical Association, Lexington, September 27, 28, 29, 30, 1920.

danger from ether anesthesia, but there surely is some danger. Every once in a while we are shocked by the death of a patient on the operating table. However these deaths may be accounted for, we know that they are practically always due directly or indirectly to the anaesthetic. When cocaine was the only local anaesthetic available there were occasionally cases of cocaine poisoning, and a few deaths have been reported. However, since the introduction of novocaine we never hear of trouble following its use. So as regards danger from the anaesthetic we surely can say that the local method has all the points in its favor.

Now let us ask the question, by which method can we secure the best results? By this, of course, we mean remove all the tonsils and leave the pillars intact and the throat in perfect condition. Of course, a clever operator will secure good results by either method and it is equally true that with a refractory patient it is hard to secure a perfect result by any method, but still all other things being equal I believe it is possible to do a neater and more perfect job with local than with general anaesthesia. One certainly has the patient under more perfect control, there is practically no bleeding and the fossae can be inspected more easily and thoroughly. This is especially true in the cases where there have been repeated attacks of peritonsillar abscess and the tonsil cannot be easily separated but must be dissected out. In these cases there is usually trouble, some bleeding with a general anesthetic and it is exceedingly difficult to make sure that the whole tonsil has been removed; with the local anaesthetic, on the other hand, there is little bleeding, one can dissect carefully and be sure that the work is done well.

After we have secured safety and a good result for our patient, our next object is to see that we make the operation as pleasant an experience for the patient as possible. There is no doubt that with novocaine the operation can be done on nearly all patients without pain. I say on nearly all patients, for once in a while we run onto a case which has an old unabsorbed abscess back of the tonsil and when we inject the novocaine we not only do not abolish pain but the fluid entering the abscess cavity under pressure causes excruciating pain and the surrounding tissue is left as sensitive as before the injection. This is a rather distressing experience for the operator, especially when he has assured the patient beforehand that the operation will be practically painless. If the injection of the novocaine back of the tonsil causes much pain, one should suspect some

such condition and inject around this point at places where the injection is not painful. If this precaution is taken I'm sure that the operation can be done absolutely painlessly in 99 44-100 % of cases under novocaine.

Some patients are so apprehensive about the operation that their apprehension amounts almost to pain. In such cases it is best to use ether. Many of my patients have taken ether at some time in the past and it is their universal testimony that the whole operation under novocaine is much less unpleasant than merely taking and coming out of the ether. It seems to me too bad to subject an adult to the unpleasant process of taking ether for as simple an operation as tonsillectomy. Small children, of course, and very nervous adults who have little control over themselves, must be given a general anaesthetic. If one should ask how young a child may be operated under novocaine, I would have to answer that I do not know. Two of the best patients I have ever had were 7 and 8 years old. In both these cases two older children in the same family were operated at the same time and the older children made much more trouble than the younger ones. With all patients we give a preliminary H. M. C. one half hour before the operation and paint the throat with 10% cocaine just before the injection of the novocaine. In this way both the general and local reflexes are largely abolished and even the most nervous patients quiet down and behave quite beautifully.

In conclusion, I would say that the local anaesthetic is safer, pleasanter and in every way preferable except in young children and very nervous adults.

One should perfect his technique in both methods so that he can practically leave the choice of method to the patient.

DISCUSSION:

S. S. Watkins, Louisville: I think the question of anesthesia for tonsillectomy should be settled by using a general anesthetic for the more difficult cases and a local anesthetic for the easy ones, with the exception that, as Dr. Cowley said, young children and nervous adults require a general anesthetic. When the tonsils are badly adherent and there is a history of repeated attacks of quinsy, it is safer, I think to give a general anesthetic, because the large amount of scar tissue will interfere with the dissection and thereby cause much bleeding, and it may be necessary to take several sutures. Such can be done much more satisfactorily when the patient is entirely unconscious, and, in most cases, a much neater dissection can be made. Also, the decision depends largely upon the operator's judgment of what the pa-

tient can and will stand. In many cases the tonsils may be removed satisfactorily under local anesthesia, and most patients of phlegmatic type will do well, but it is not always true.

In regard to general anesthetics, I wish to say that I believe the insufflation method of giving ether is a very good one. The larynx is exposed with Jackson's laryngoscope and a 23 or 24 catheter is passed down the larynx and slightly below the vocal cords. The catheter is then connected with the inflation machine. Thus the ether is given directly into the trachea. The salivary glands are only slightly stimulated and there is little or no saliva, as under the usual methods of administering ether.

One of the most important points in the operation is putting the patient in a modified Trendelenburg position with the head of the table down at an angle of from twenty to thirty degrees. This position greatly lessens the chance of aspiration of the blood, saliva, etc.

I do not think the anesthetic has a great deal to do with the aspiration of the blood; it depends more upon the operator. Several years ago I made a study of a thousand cases of tonsillectomies that were done in a large hospital in the East under ether. There was not a death from pneumonia or any other cause; whereas, in another large hospital in an Eastern city, 8 cases of lung abscess after tonsillectomy, occurred in one year. In some of these cases the tonsils were removed under local anesthesia.

A very important point is to control the hemorrhage before the patient leaves the operating table. That can be done and it should be done. The best way I know of controlling hemorrhage in the tonsillar fossae is the method used by Dr. Crowe at Johns Hopkins. I will briefly describe it: First catch the bleeding point with a large Kelly clamp and, next, with a small round, curved needle on a Mayo forceps, take a bite of about one-eighth inch of tissue on each side of the bleeding point; then unthread the needle and tie. Thus the bleeding point is forced between non-bleeding tissue. One can train himself to tie with his fingers and it is not necessary to use specially designed forceps.

J. A. Stucky, Lexington: The subject of tonsil operations, like Tennyson's brook, runs on forever. I want to commend to this Association everything Dr. Cowley said. There are one or two points I am surprised he did not mention, and I want to mention them with some emphasis. No part of my work has undergone such a radical change as the tonsil operation in the last ninety days. I now prefer, in all cases over twelve years of age, local anesthesia, and I have never used local anesthesia with satisfaction and knowledge and got the results that I have in the last 90 days. I now have in my tonsil operations the same teamwork that I want to have

in my mastoid or major operations. I want an assistant by me and a nurse in front of me who knows what to do, when to do it, and how to do it.

Dr. Cowley failed to mention one thing when he spoke of controlling hemorrhage, and that is this: Don't sponge too much. There is more harm done to the mucosa of the pharynx by ramming sponges in there during the operation than the bleeding that will occur. Go right to the point and constrict it and then stop, and assist nature in coagulation by using some hemostatic. I use thromboplastine locally and for one or two minutes after enucleating the tonsil, as soon as the mouth is closed and the muscles relaxed you get fine coagulation. In 214 cases where I have used this, I have not had secondary hemorrhage.

Another thing I want to call attention to which has undergone a change in my practice in the last sixty days is this: I usually adopt the routine practice of making a coagulation test in every adult I operate on. I have had one patient that I had to tie a small vessel, simply because it required eleven minutes for his blood to coagulate. In some of the great institutions, like the Mayo's and Battle Creek and other places, they make coagulation tests and, if indicated, give the patient lactate of calcium until coagulation comes within three minutes.

W. B. McClure, Lexington: The placidity of the patient under local anesthesia, as described by the essayist is so at variance with my own experience that it would seem there is something about it I have not yet learned. For instance such experience as the patient going to pieces under short pain. It is not a question of pain, but one of fear, and all the local anesthesia you may use does not destroy that fear. Some of the gentlemen discussing this paper can probably go back and recall the experience they frequently had of a patient going to pieces after the first tonsil was removed, painlessly, and leaving the office without having the second tonsil removed. Not infrequently we come in contact with such cases. I have had that experience in a nervous woman, so that I have concluded the question of anesthesia is one of selection. You have got to know your patient pretty well and study his or her temperament, and then decide. There is no line of demarcation as determined by age or any other condition. You cannot say very well that in this case you should or should not use a local anesthetic.

There is a very important class of cases—I do not care if they be 60 years of age—that should always have a general anesthetic. I refer to those repeated cases of peritonsillitis, where you have got such extensive and such firm adhesions that the tonsil has to be dug out

in sections, and I do not believe that there are many cases among patients who will allow us to do that amount of digging without going to pieces, even though you do it without pain. Oftentimes the difficulty is to control hemorrhage in a patient who becomes nervous under local anesthesia. They know what is going on, and they are going to assert themselves. I heartily agree with Dr. Stucky that the question of coagulation should be practiced universally. I do not believe it is universally done, but it ought to be done. We are sometimes careless because we are in a hurry, but the blood should be tested as to its coagulability before the operation is done.

Roscoe S. Plumlee, Smiths Grove: I do not desire to talk for the purpose of being heard because it is not worth the price. However, as a general practitioner I have made some observations. Dr. Frank Billings, in a paper and discussion before the Wisconsin Medical Society, in the home of goiters, stated that we also have a great many cases of focal infection. That was the principal point of his paper.

It has been my privilege to observe a number of operations done in a hospital, and I was going to say what Dr. McClure did, but he said it so much better than I can, it has knocked me out of saying it; but Dr. Stucky has certainly satisfied himself that local anesthesia is the thing for the removal of the tonsils. Probably he will later decide, like Dr. McClure, that there is a temperamental condition connected with all of these tonsillectomies.

A large percent of these people take the whole family with them, talking to them all the way to the hospital, and talking to them after they get to the hospital, and by way of compromise, if you will chloroform the other members of the family that go with the patient, you will sometimes get the local anesthetic to work well on the patient. (Laughter.)

Again, if the practitioner has the confidence of his patient, he can explain these conditions and will remember the temperament of the patient if he is a psychiatrist, which he ought to be. Then he can explain the situation before the patient leaves home, advise him to go alone, and advise him to exercise his own judgment about the anesthetic. These patients should be able to decide for themselves whether they want a local or a general anesthetic. It is true, some people are afraid of a general anesthetic, and they will undoubtedly decide in favor of local anesthesia. If the patient is going to have a spasm, you might as well chloroform him before he leaves home. (Laughter.)

J. G. Carpenter, Stanford: As a hill-billy doctor, I have observed in some cases in which local anesthesia has been given, that if the patient is not nervous the operator himself is somewhat

nervous, and he in turn makes the patient nervous. The doctor ought to be cool and composed—a Noble Grand in every case. Every doctor ought to be able to make use of some suggestive therapeutics; he ought to make an impression upon his patient's mind by showing him the light, the truth, and the way, and say follow thou me all the way. The doctor is a better judge of whether a patient should be given a local or general anesthetic by studying the temperament of the individual. The old doctor knows what anesthetic to give, and his experience is great—his wisdom stupendous, and of paramount benefit to the patient.

As a hill-billy surgeon I want to speak of the control of hemorrhage from the tonsils. Take a curved perineal needle and introduce it through the flesh, then put on your shot and clamp it, then clamp the shot, and the hemorrhage is controlled, and the patient is happy, and you can go on your way rejoicing and whistling. (Laughter.) So mote it be, it is a great thing to be a hill-billy doctor in Possum Hollow, and not see through a glass darkly. What we need in our profession is light—yea, more light, skill, science experience and wisdom. Too many tyros in the profession—too many self-satisfied doctors, too lazy to learn and invent better ways.

R. H. Cowley (in closing): I want to show the mouth gag and tongue depressor which I use for work with general anesthetic. This is the Davis mouth gag and tongue depressor. It is decidedly the best instrument for the purpose that I have seen. When the depressor is put into the mouth and the jaws opened, the base of the tongue is pressed against the epiglottis and the breathing interfered with. So it is necessary in using the instrument to have the assistant holding it raise its lower end, as it were, suspend the mouth by its lower end. The base of the tongue and with it the epiglottis is in that way pulled away from the glottis and the breathing is perfectly free. With the mouth gag wide open and a large sized catheter connected to a suction apparatus, passed through the nose to draw off the blood and secretions, one has as large and clean a field to operate in as in an abdominal operation.

I differ with the doctor in regard to the cases where there are dense adhesions as a result of previous peritonsillar abscesses. These are in my opinion precisely the cases where the local anesthetic is most valuable. With the novocaine and these scissors a blunt and practically dry dissection can be done. By working carefully, the operator is able to see exactly what he is doing, a thing which is by no means sure nor easy with a general anesthetic, where the field is more or less obscured by blood. It is also more difficult to make sure that the whole of the

tonsil has been removed with the general anesthetic.

In regard to the use of a needle to control hemorrhage, I would say that I think this an unnecessarily difficult procedure. I have never seen it done quickly and easily, even by very skilled operators. Moreover, it is just as effective and much easier and quicker to catch the bleeder with a forceps and tie it off with a single knot of number two chromic gut. Hemorrhage is practically a thing of the past in our hospital where this method is used and every bit of bleeding is controlled before the patient leaves the table.

As to nervous patients, I would simply say that one must size up the patient before deciding which method to use. If he feels that the patient will not cooperate he should use the general anesthetic. If the patient will tolerate the tongue depressor well before operation, there is usually no difficulty with the local. I have never been compelled to turn from the local to the general during an operation. I always give a hypo of Abbott's H. M. C. thirty minutes before starting and paint the throat with 10 per cent cocaine before injecting the novocaine.

Dr. Stucky speaks of injuring the mucous membrane of the pharynx by rough swabbing. This may be an important matter if one does not use ordinary care; however, by being careful with either method one can retract the anterior pillar and with sponges of the proper size, the fossae can be sponged clean without touching the pharynx at all.

When using novocaine, I remove one tonsil and completely stop bleeding with clamp and catgut, before starting the other. With the general anesthetic, I remove one tonsil and immediately place in the fossa a small sponge saturated with thromboplastin. Over this I place a larger dry sponge and clamp it in place with a large clamp which has one arm outside the neck. I then remove the other tonsil, and by this time the bleeding is usually stopped. If it is not, I clamp the second fossae and proceed to catch the bleeders in the first. I never let a patient get off the table till the fossae are both dry and clean.

Linear Division of Pyloric Sphincter.—Pannett reports on the results of a study made to determine the immediate and remote effects on the normal stomach of a division of the pyloric sphincter without injury to the mucosa. The operation leads to a certain initial increase in the rate of passage of food through the stomach, and a probably earlier complete evacuation of this viscus. These effects may be temporary or permanent according to the method of healing of the wound.

INTENSIVE STUDY OF CARDIO-RENAL DISEASE.*

By C. W. DOWDEN, Louisville.

Our knowledge of kidney disease dates backward fifteen hundred years and there has scarcely been a year in the meantime that some new theory or new information has not been added concerning the normal or pathological function of the kidney.

Christianson added the knowledge that the disease tended to suppress the solids in the urine and emphasized the impregnation of the body fluids with urea. A little later, Rayer, an Englishman, concluded that the chief characteristics were albumin in the urine, which contained less salt and urea than the normal. Following him came Henle, the anatomist, with his description of the histology of the kidney, and a little later Bowman's great work dealing with the finer structures of the kidney. Then followed Toynbee, describing interstitial cellular proliferation, and Johnson, describing especially fatty infiltration of the tubular epithelium. In 1852 Virchow published his celebrated article on parenchymatous inflammation and in 1859 Arnold Beer drew interstitial connective tissue into the discussion. A little later Klebs estimated glomeruli nephritis as a special type and this was regarded by Ribert as the universal incipient lesion of all forms of Bright's disease. Senator thought this impossible and proposed the term Diffuse Nephritis, admitting at the same time a difference between interstitial nephritis and arteriosclerotic kidney.

Generally speaking, all the older literature on kidney disease dealt with renal structure, with only a hint here and there as to renal function. However, it is well to remember that the present day tests are the outgrowth of observations made many years ago as to fluid and salt retention, low specific gravity, etc. What appeared to be (and no doubt was) a great step forward, was the experimental study of nephritis in animals. Christian, Smith, and Walker observed closely uranium nephritis in guinea pigs and combined function with morphology. The method seemed ideal and added much to our knowledge especially of diuretics in the treatment of Bright's disease. However, in a later paper, Christian, with Frothingham, O'Hare and Woods, after a study of a number of cases of chronic nephritis, the patients dying and coming to autopsy, concluded that there was no constant relation between the anatomo-

*Read before the Kentucky State Medical Association. Lexington, September 27, 28, 29, 30, 1920.

mical lesion and the renal function in so far as the excretion of phenolsulphonaphthalein, albumin and casts in the urine, presence or absence of edema, blood pressure determination, etc., were concerned. Therefore, it would seem that the present day method of determining functional capacity, regardless of the character of the lesion, bids fair to prolong the life of the sufferer from any chronic disease and especially disease of the kidney, since it lends itself admirably to such investigations. Many methods of determining kidney function have been developed during the last few years.

The chemistry of the blood, especially with reference to its nitrogenous products, has been studied by many observers. The phenolsulphonaphthalein test of Rountree and Geraghty has been widely used. The Hedinger and Schlayer test meal, which was modified to Mosenthal, Christian and others, was to determine renal function by estimating the intake of fluids, salt, nitrogen for a given time and quantitating each in two-hour specimens of urine for the same period. Ambard's laws dealt largely with intermediary metabolism, and his plan was to determine the kidney's maximal concentrating power. He held that a comparison of the concentration of urea in the blood with its rate of excretion in the urine reduced the unknown factors to be rate of blood flow through the kidney and the functional activity of that organ. In a general way the same view was held by many older observers, chiefly Ludwig (1844) and Senator and Monk. The formula has been amplified by McLean and offers a good index to renal function.

It can hardly be said that any of the foregoing tests were devised with the belief that they would come into anything like general use and thus be of much benefit to the nephritic. Most of them are only applicable in hospitals, and while not difficult to perform, the fact remains that only approximately one-tenth of one per cent of all physicians are familiar with or able to use the tests requiring blood chemical methods. If we were to depend upon one doctor out of every thousand to determine kidney function, by these methods, only a very few nephritics could be reached. If the majority of people are to be benefited by determination of the functional capacity of the kidneys, then the more elaborate tests must be simplified or made to serve as standards against which simple and easily-applied methods may be checked; they must be applicable in the home without the aid of a trained nurse; they must not require elaborate apparatus; they must not require much knowledge of chem-

istry and they must detect the earliest signs of kidney disease.

Certain fixation of specific gravity depends upon disturbance if not actual disease of that portion of the kidney unit which has to do with the elimination of the urinary constituents, particularly salt. Marked disproportion between the intake and output of fluids certainly concerns the transudative property of the glomeruli and secretive property of the tubules, if such they possess. Any pathology which will interfere with the normal concentrating power of the kidney and either allow nitrogenous products to accumulate in the blood or to decrease in the urine, which will increase the constant of Ambard, if the rate of excretion of urea depends upon the laws he has formulated, which will decrease the phenolsulphonaphthalein output within two hours, will, I believe, produce a certain limitation to kidney function, depending upon its extent and degree, which can be estimated by fixation of specific gravity, nocturnal polyuria, or retention of fluids. Do not these tests vary with pathology of any portion of the kidney unit?

It is my opinion, which is amply confirmed by experience, that by a careful examination of each voiding of urine, regardless of time and covering a period of three days or longer, during which only capacity diet is insisted upon, that in the quantity especially of the night urine and the fixation of specific gravity at a high or low level, that practically as many facts concerning pathology or function can be obtained as by the more elaborate methods. Comparing the daily output with the intake offers not only valuable diagnostic evidence, but is a most helpful index for proper treatment.

I am firmly convinced that the indiscriminate advice to nephritics to drink abundant water is wrong and probably as dangerous as to advise them to eat plenty of meat and salt. As a matter of fact, in chronic nephritics, the salt output is but little or not at all disturbed. It is somewhat discouraging, after having had a patient under observation for several weeks, having studied the renal capacity by the various methods and having found that 1,000 cc of fluid is the maximal quantity the kidney can handle, and that the salt secretion is adequate and the nitrogen excretion sufficient, to have him advised by someone else without any investigation whatever, to drink a gallon of water daily and stop the use of salt and meat entirely! Unfortunately such advice is still offered by several recognized diagnostic institutions, which makes matters worse, because it is accepted as authoritative.

I should like to speak about one case in particular that is fairly representative of a common type that every physician frequently sees. It is a combination of a heart and kidney lesion, the first probably primary, but after years of neglect or improper management finally producing definite kidney damage. The patient, an unmarried man of 62, a farmer and stock trader presented the following history:

Family History: Mother died at 67 of some uterine trouble. One sister died at 8, diphtheria.

Previous History: Usual infections of childhood including diphtheria at 12. Always had bad throat and was always croupy. Had malaria and many bilious attacks. Said he was "salivated" at age of 12. Had typhoid at about 26, very badly but no complications. Had pneumonia twenty years ago and slight attack before that. Bilious attacks when young. Only colic he has ever had was after eating honey and sweet milk. No injuries and no operations. Never used tobacco and practically no stimulants. Has been fairly regular in habits, but eaten too much and had little exercise.

Present Illness: Two years ago stayed around house doing nothing and ate too much but felt nothing more than discomfort. In December, 1918, began having bronchial trouble and says "physicians gave him medicine that gave him serious trouble." In February and March he got so he could not breath lying down at all, and was taken to hospital and physicians told him he would not live till morning. At this time extreme dropsy. Was in hospital for four weeks and then went home and trouble gradually recurred and he returned to the hospital in September. No pain but the heart has been weak, irregular, and at times down to 50 or less. The edema has been off and on and responded twice to Karrell diet, but this made him very weak. Has coughed little. The urine has been scanty, due, he says, to restriction of fluid. No headaches or dizziness. Some slight asthma. Cannot lie down flat on account of breathing. Stomach has given little or no trouble. Has kept intestinal tract in good shape with salts or oil. No fever.

Weighed 240 pounds in February, 1919. In five weeks after this while in hospital he went to 170, then to 210 until he returned to the hospital in September and now weighs 190.

Physical examination: (Propped up in bed.) Dyspneic. Conjunctiva tinged but withal a fairly well nourished man.

Head and neck: Upper plate. Few bad teeth below.

Heart: Galloping rythm. No irregularity now but for two days on digitalis. Considerable arrhythmia in beginning. Dullness increased both right and left. Sounds indistinct and distant; blowing systolic murmur transmitted all over left chest. Slight over aorta. Blood pressure 144-80.

Lungs: Increased breath, voice and tactile fremitus over upper portion of both lungs posteriorly. In right especially there is flatness with decreased voice and fremitus at base posteriorly to tenth rib and less so on left. Scarcely to be detected anteriorly.

Abdomen: Border of liver palpable but not tender. Considerable distension. Spleen not palpable.

The urine contained a large amount of albumin with many casts of all kinds. The phthalein output was 23% the first hour and 16% the second hour. The blood chemistry showed 53.5 mg. of non-protein nitrogen and 66 mg. of urea. The urea acid was 7.8 mg. per 100 cc. of blood. The constant of Ambard was .25 against a normal of .06 to .09. The Mosenthal test diet was given and the several specimens of urine showed a very marked fixation of specific gravity of from 1.009 to 1.011. There was marked nitrogen retention, only 3 gms of 12 gms being excreted. The X-ray examination revealed a tremendous heart with particularly enlargement of the left ventricle and marked arrhythmia. With the usual treatment of digitalis and a diuretic there was rapid amelioration of the urgent symptoms and in four days all drugs were discontinued to be resumed only when indicated. At this time a diet low in proteins (containing only 3 gms of nitrogen) was started and the nurse was carefully instructed concerning the measuring of all fluids taken and the urine voided. These two figures were to balance within four ounces. It was very surprising to note the degree of comfort when the balance was maintained, and great was the discomfort when this balance was disturbed. The patient rapidly improved and one month later the urea in the blood had dropped to 53 mg and the constant to .157. The uric acid remained the same. The treatment was continued using the low protein diet and maintaining the fluid balance and a month later the urea was 44 mg and the constant was .146. The phthalein remained the same, namely 39%.

At this time the patient returned to his home taking the nurse with him. The same treatment was continued, using a few doses of digitalis and diuretin when the balance of fluids was disturbed and keeping the diet at the same low point in nitrogen. In June two months later, he was doing so nicely

that he began taking liberties with his fluids particularly, and more or less so with his diet, as a result of which his limbs again began to swell, dyspnea was extreme, and he had to a marked degree all the symptoms of a cardiac decompensation. The blood chemistry showed at that time 22.1 mg of non-protein nitrogen and 47.29 of urea. The constant of Ambard was .234. He returned to the hospital where the usual remedies were applied with success except that the dypnea remained and it was determined by physical examination and flourescopy that he has a large pleural effusion which a thoracostesis by Dr. Wallace Frank immediately relieved. The treatment was resumed and soon the patient returned home with his nurse, where has since remained following the same line of treatment. He has been entirely comfortable, goes over his farm every day in a buggy and enjoys more freedom than for a number of years. In August of last year, due to a slight intercurrent infection, the constant of Ambard increased to .173, although the urea in the blood was 34 mg. The figure was due to the low output of urea in the urine which amounted to only 5 gms in 24 hours. The 'phthalein had dropped to 29%. This, however, was only a temporary condition, since the last analysis made in December, 1920, showed a normal blood urea, 34 mg, and uric acid 6. The constant of Ambard was .141 and the 'phthalein output was 49.5%. The blood pressure was 115 and 72. The weight was 183 pounds. The marked improvement in the heart condition and especially the size can only be appreciated after viewing several plates made at different times. The patient is living a very comfortable life at the present time, but finds it absolutely necessary to restrict his fluids to a low quantity and to keep his food very low in proteins. The attached list shows at different periods during the year the high and low specific gravity of the urine during the day and the fluid balance.

	FLUID INTAKE			URINE
	HIGH	LOW	(OZS.)	
June 15, '20	1.024	1.012	29	31
June 30, '20	1.024	1.016	29	22
July 15, '20	1.024	1.028	17	14
July 30, '20	1.030	1.022	20	16
Aug. 15, '20	1.030	1.024	16	10
Aug. 30, '20	1.026	1.020	23	18
Sept. 15, '20	1.032	1.010	23	13
Sept. 30, '20	1.032	1.018	27	13
Oct. 15, '20	1.032	1.030	29	8½
Oct. 30, '20	1.028	1.024	13	14
Nov. 15, '20	1.022	1.014	18	36
Nov. 30, '20	1.030	1.026	16	15
Dec. 15, '20	1.028	1.026	18	18
Dec. 30, '20	1.030	1.026	18	20

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DISCUSSION:

Leon K. Baldauf: Dr. Dowden is to be congratulated on the excellent paper which he has written, and especially on the results he has obtained in the character of the cases reported. We are doubtless all agreed now that a single examination of the urine is practically without value; there is little knowledge to be gained from one examination except in cases where the urine contains a considerable amount of albumin and large number of casts.

The great difficulty in treating cases like the one he has reported in detail is there are few people who can afford to have a nurse for fifteen months. In the poorer class of patients where several things have to be considered, the results are not often so fortunate. Many people suffering from cardiac or renal lesions not only cannot afford to have trained nurses and special examinations, but they have to make a living, and this, of course, works a great hardship on them. However, there are a number of people who can afford these special examinations and therapeutic procedures, and the results which Dr. Dowden has obtained are very brilliant.

The feature that impressed me very much was the essayist's statement about the intake and output of water. We are all familiar with the advice usually given patients to drink

plenty of water that it is healthful, etc. It has been definitely established that, where the kidney is diseased, the ingestion of large quantities of water is harmful.

Another important feature mentioned by Dr. Dowden is the blood chemistry. There is no question about it, blood chemistry examinations ought to be made in the class of cases under discussion, and these investigations should be made promptly to determine the condition of the patient. These examinations, however, are sometimes rather difficult to make, and they are also rather expensive, and the methods outlined by Dr. Dowden simplify matters considerably.

In many of the cases that come to us, we are at a loss to know just what to do. I recall a patient who was at one time under the care of Dr. Dowden and afterward came to me. The man had a large amount of albumin in his urine. We were at a loss to account for this marked albuminuria which was not dependent upon rest or exercise. We thought at first it might be one of those strange cases where if the patient remained quiet the albumin would disappear, but this proved untrue. I have had any number of cases where a large amount of albumin and a great number of casts would persist in the urine under all sorts of treatment.

In certain types of cases the treatment of nephritis is very satisfactory, but in many of these cases treatment gives poor results. I have about concluded that the most good can be accomplished in cases of beginning nephritis and cardiac disease by trying to prevent further extension of the process by removing all possible foci of infection, etc. It is only occasionally that we can hope to secure the splendid results mentioned by the essayist. In many cases we are practically helpless.

Henry Enos Tuley: Dr. Dowden has given us a very interesting presentation of the subject. I would like to ask him in closing to say something about the prognostic value of the examination for creatinin and the amount which is abnormal. We have been able to watch quite a few of these cases at the Louisville City Hospital, and have found that retention of creatinin, where blood chemistry has been done, had considerable prognostic value.

Some of you will recall a case which I mentioned at a meeting of this society, a nurse who had acute nephritis, in which there was a tremendous retention of creatinin. Of all the other elements that are retained in the blood in chronic nephritis, we believe that creatinin is one of the most valuable of the prognostic signs.

Dr. Dowden has laid a great deal of stress for several years on the importance of developing tests which were of value to the general practitioner. When blood chemistry is suggested to

the general practitioner, he is generally at sea because he is unable to make such elaborate tests. I agree with Dr. Dowden that as a rule sufficient information can be obtained by more simple tests, such as the intake and output of fluid, the examination of two-hour specimens of urine, and the fixation of specific gravity. All of these features are of great value and can be given proper attention without any trouble in the home of the patient if necessary. This feature of Dr. Dowden's paper is to be especially commended, because such examinations are not beyond the reach of the average practitioner of medicine, and if he will watch the patient carefully and make use of these simple tests a great deal of good can be done.

J. Rowan Morrison: I have been interested in the subject discussed by Dr. Dowden for a long time and the methods he has described are of great advantage in the treatment of nephritis. The importance of this character of work has been emphasized by several other observers. By giving the patient proper attention, as stated by Dr. Baldauf, I believe it is possible in many instances to prevent the development of nephritis.

Take a patient who had an attack of scarlet fever when young with considerable damage to the kidneys as a result: I doubt if physicians ordinarily pay enough attention to such an individual; they should carefully examine the urine at frequent intervals for albumin and casts; they should regulate the intake of proteins, water and salt; they should investigate the elimination of water, salt and protein, etc. I believe an attack of scarlet fever and in fact any other infectious disease will make that patient a potential nephritic, and we ought to watch the intake and output of water, salt and protein in such an individual carefully. We should also protect him as much as possible from over-strain; bad teeth and tonsils should be removed; gastro enteric disturbances corrected, etc. I believe in many cases of this kind we can prevent the development of serious nephritis if we will watch the patient carefully and examine him at frequent intervals. We should always bear in mind that acute infectious diseases often lay the foundation for future nephritis because of their effect on the kidney. In the majority of cases of nephritis I have seen there was a history of some infectious disease many years ago.

Regulation of the intake of fluid is an important feature in these cases. Four or five years ago when I was especially interested in this class of work in the University of Louisville, a negro came to the clinic with marked dropsical manifestations. Investigation showed that his intake of fluid was four and a half to five gallons per day—beer, water and milk.

His heart was tremendously enlarged reaching almost to the axillary space. He did not have syphilis. He gave the history of some infectious disease years before. He was doing rather strenuous work at the time. I had him discontinue his work for two months and limited his intake of fluid to three pints daily. Marked improvement in his condition was noted within two months. I have seen him every two or three months since that time and he has remained comfortable. He still has some enlargement of the heart, but it is not nearly so marked as formerly; he has no dyspnea nor dropsey at this time. He is still limited to three pints of fluid daily and is living a very comfortable life. Careful urinalysis at the time he came under observation showed a low specific gravity, some albumin and a few casts. Had fluids not been withheld it is quite probable this man would have died within a short time.

A woman came to me six weeks ago. She was also a large fluid consumer; she had an enlarged heart; urinalysis showed albumin, a few casts and low specific gravity. No blood chemistry was done. By limiting the intake of fluid to two pints daily, reducing the nitrogenous material and increasing her fats, she has made a surprising improvement.

On the other hand we sometimes see cases in which the trouble seems to be due to salt intake. This can be easily determined by investigation of the salt retention. By careful analysis the proper amount of salt intake can be determined for the individual patient. If too much is being consumed the amount must be reduced.

In some cases the protein intake must be reduced; in others it may have to be increased. In nephritis it is of benefit sometimes to reduce the protein and increase the ingestion of fats. This will give the patient the proper amount of calories needed and increase his strength and well-being.

A very interesting case was shown in the Johns Hopkins Hospital at one of the medical clinics during the meeting of the Congress of Physicians in Baltimore. The patient came in with a rather acute attack of nephritis and the history showed that for some time he had been kept on a strictly milk diet. After blood chemistry investigations had been made, this patient was given five grains of protein per day, his intake of fats was increased, he was given carbohydrates, thus raising his calories from 1,000 to 4,000 per day. There was marked improvement and the patient returned to his normal diet after a few weeks. His kidney symptoms eventually disappeared and he had no further trouble. In many of these cases it is necessary to reduce the fluid intake

and increase the fats. A milk diet is usually contraindicated.

I think the future improvement in the treatment of nephritis is going to be along the line of not how much albumin and casts may be in the urine but the ability of the kidney to handle water, salt and protein. These factors must be carefully regulated to produce the best results. Very few patients with nephritis seen ten or twelve years ago are with us now. I have under observation a few patients who developed nephritis twelve or fourteen years ago; they still have a low specific gravity of the urine, but have remained comfortable on restricted diet and suitable medication. The majority of these patients die either from apoplexy or uremia. Christian said in his paper, read before the meeting of the American Medical Association at New Orleans in 1920, "there is no reason for being optimistic although there is much which may be done in cases of nephritis."

As Dr. Dowden has emphasized in his paper, the best results are to be secured by having an ideal patient, under ideal conditions, watched in an ideal manner.

C. W. Dowden (closing) Answering Dr. Tuley's question: In acute attacks of nephritis we frequently find the creatinin content of the blood above 5 mgm., even as high as 10 or 12 mgm., in connection with the retention of urine and nitrogenous products, and yet the patient will recover under proper treatment. In chronic nephritis, however, as a matter of fact, until about two years ago there were no cases of recovery reported so far as I know, and it was the general belief, and was so stated, that when there was as much as 5 mgm. creatinin in the blood, one could feel perfectly assured that the patient would not live over six months. Dr. O'Hare, of Boston, had under observation one patient who lived about a year, and another for eighteen months, with more than 5 mgm. creatinin in the blood, and I think several other similar cases have been reported. Therefore the prognosis of death within six months is not safe although generally true. In my own experience, I have never seen a single patient with chronic nephritis that has lived six months with a blood creatinin of more than 5 mgm. I saw one patient who lived four months, a woman who had repeated attacks of uremic convulsions, and it looked as if she would die in each of them, but she survived for four months and then died.

I am now making it a routine practice to have the nurse save every voiding of urine and record the specific gravity on a chart prepared for that purpose. It is surprising how often early signs of kidney disease are detected by

this plan. By examining the chart every morning the quantity of urine voided is easily determined. The fluid intake is also carefully measured. The fluid balance must agree within four ounces each day. I suppose I have at least one hundred charts showing the urine voided, the fluid taken, and the specific gravity of each voiding. The plan is much easier than saving a twenty-four-hour specimen of urine.

It is a very simple matter to provide the nurse with a sufficient number of bottles which have been properly sterilized; she carefully measures the quantity of urine voided, takes the specific gravity and records it on the chart. By comparing the fluid intake with the urine voided it is not difficult to maintain the proper fluid balance. This gives a complete record from day to day. We allow a difference of four or five ounces if the patient has diarrhea. In extremely hot weather some allowance must also be made for the fluid lost in the perspiration, but this amounts to very little.

THE RELATION OF MOUTH INFECTION TO SYSTEMIC DISEASES.*

By G. H. HEYMANN, Louisville.

I shall not go into detail on any of the diseases which are supposed to be caused or fed by the focus of infection in the mouth, for you gentlemen know more now about Anemia, Arthritis, Nephritis, Myocarditis, Endocarditis and the other systemic lesions which are fed from a focus of infection than I could possibly tell you.

That the medical profession and also the dental profession have been over-enthusiastic on account of the results obtained by the extraction of abscessed or pyorrheal teeth in certain cases and have caused the needless extraction of many good teeth in other cases, should make us a little more careful in the future.

Of late it would seem that dental infection is the cause of most all diseases and that the extraction of the teeth is the specific treatment for these diseases until we hear from the patient that, "They made me have all my teeth extracted and it didn't help a bit."

I have heard it jokingly remarked by dentists many times that when a physician doesn't know what is the matter with a patient he usually sends them to a dentist to have their teeth extracted. This is no joking matter and before we condemn a tooth or teeth, we

should be reasonably sure that it is best for the patient.

That pathological conditions around the roots of teeth or in the gums around the necks of the teeth may be transmitted to other parts of the body and may be the cause of pathological conditions, I believe, cannot be denied by anyone who has examined the work that has been done upon these subjects during the last few years.

That teeth are a most important feature in the origin of systemic diseases, must, I think, be accepted as clearly demonstrated. We have all had the pleasure of seeing great improvement in patients' health after we have corrected some dental disorder or condition. These corrections are either eradications or reductions in the source of infection found associated with the teeth and jaws. We have seen these improvements and cures when no other treatment was pursued and no other treatment was possible until the dental disorder was corrected.

In all cases when there is dental infection it is an insidious underminer of the patient's health and resistance.

To say that focal infection or dental infections are the specific and only cause of any definite disease or disorder would be absurd. Patients who have these infections usually suffer no local pain or discomfort and are not conscious of any departure from normal. Upon casual examination we may also discover no apparent deviation from normal, for there may be no pus, no odor, no pain, yet the micro-organisms, which are most dangerous—especially the streptococcus veridans—which are of so low grade and propagate so slowly, even in the confined walls of the alveolar bone that they set up no violent reaction may be present at the apices of a tooth root or in a pocket under the gums at the necks of the teeth and give no physical discomfort. Furthermore, they produce their effect so remote in time and place from their origin that the original source of infection may be ignored or overlooked.

The X-Ray, which plays such an important part in diagnosis, has the most important influence on bringing the medical and dental professions in very much closer co-operation.

While it is possible to thoroughly examine a mouth without the X-Ray, we must not forget that the radiograph does not picture disease but only shows evidence of infection and the value of the picture depends entirely upon its correct interpretation.

As X-Ray pictures are only shadow pictures we must frequently make stereoscopic views before reaching a final decision.

Numerous times I have found abscesses at

*Read before the Kentucky State Medical Association, Lexington, September 27, 28, 29, 30, 1920.

the apices of the best looking teeth and pyorrhea pockets where the gums looked normal. A very important point which should never be overlooked in making radiographs of a mouth should be where teeth have been extracted. Time and again we find a small root end which was perhaps overlooked at the time of the extraction and is in bad condition, or perhaps a tooth was extracted before the days of curettment and the gums have healed, yet the infective process still goes on.

In the examination of the mouth we must take in every means of diagnosis at our command. We must carefully inspect the whole mouth. We must inspect the gums and teeth. We must note the number of fillings and character of all dental work. All discolored and crowded teeth and those with large fillings must receive careful attention. We must examine the condition of the gums as to inflammation, swelling and sinuses. If secretions or pus can be pressed out from the gum margin. In fact, in our examinations we should not overlook any condition in the mouth which might have a bearing on the case, and if the physician (who usually has seen the patient first) would give to the dentist the history and physical findings, then the dentist should be able to give a diagnosis of at least a differential value.

While I believe that the dentist should be the one to decide whether the teeth are a foci of infection or not; the dentists who are still devitalizing teeth or treating abscessed teeth with the view of leaving them in the mouth should not be the ones to pass upon such a vital point.

As perfectly filled root canals are not immune to infection, if any pulpless tooth is present when there is systemic infection I believe we are justified in ordering its removal. If pulpless teeth are going to become infected and continue to do so, and if our patients are going to continue to be infected from this source we cannot safely retain them, so why not get rid of them as a prophylaxis measure? What difference does it make whether the tooth infection is primary or whether some other systemic condition is primary if it is necessary to eliminate all sources of infection to effect a cure?

While apical infections are pent up in the jaw bone, causing absorption and constant distribution we must not forget that we find the same types of germs in pyorrhea pockets that are found on root abscesses. These germs are well protected in the abnormally deep gingival space where we find abundant opportunity for multiplication, and coming in contact with the broken capillary walls they

are carried directly into the circulation. As long as the condition exists there is constant opportunity for the entrance of active virulent germs, which whenever the general resistance is low, may produce their characteristic pathology and death.

It is said that more teeth are lost through pyorrhea than through decay and when we take into consideration that the gingival borders of the gums present an area eight times greater than that of the crypts of both tonsils, and in the average adult mouth the gums are congested and bleeding, we may get an idea as to the amount of infection which may be present.

As it is generally believed that pyorrhea cannot be cured, I desire to state that it is curable and also preventable. I have had many cases of systemic involvement when there were no abscessed teeth and after getting rid of the infection in the gums around the necks of the teeth have had the pleasure of seeing the patients return to a normal state of health.

In conclusion I might say that as we know not the resistive powers of the individual, and as the mouth is the gateway to health of our patients, and as caries and irritants are the main causes of mouth infections, and as proper prophylaxis is our chief weapon with which to fight these causes which make possible these focal infections, then proper prophylaxis is the highest form of service which a dentist may render.

DISCUSSION:

Leon L. Solomon, Louisville: If brevity is the soul of wit, Dr. Heymann has thus far eclipsed all predecessors. His paper is brief but to the point.

For about a year and a half, we have made it a point in our everyday routine examination in the Clinic, to examine carefully the mouth and teeth of every patient, presenting for diagnosis. The examination is first made by our dentist, a member of the staff, and afterward such teeth are x-rayed, as he directs. Some months ago, we had an experience, similar to the one alluded to by the essayist. We had a lady who had been having frequently recurring attack of so-called inflammatory rheumatism. Other things had been done for her, in our search for the cause, except to ray her teeth. She had no teeth in the mouth—supposedly none; there were none to be seen; the teeth had been extracted. She came into the office one day, in seemingly rather good state of health, from her home in a nearby Indiana town. She came simply to present herself for further observation. We had previously seen her on two occasions. Suddenly she was so

ill and her joints so involved with pain and swelling, it was necessary to send her to the infirmary. A so-called acute inflammatory rheumatism attack had presented, involving smaller joints and larger joints. Where was the focus of infection? We found it in her mouth, around several diseased roots, which the x-ray revealed, though all of her teeth had been extracted several years previous. Despite the fact, that our patients sometimes chide us, saying they have had their teeth removed and derived no benefit, I believe more people are benefitted by the swing of the dental pendulum to the extreme, than have been harmed. We have been impressed in our Diagnostic work in the clinic, with the fact, that the pyorrheal pockets, referred to and elucidated by Dr. Heymann, are productive of as frequent harm and of as great a degree of harm, as the apical abscess.

There is a phase of the subject, however, Mr. President and gentlemen, which occurs to me as indicative of something more than ordinary. I refer to the fact that a dentist appears before this society and addresses us. I recall and it was not so many years ago, when there was such misunderstanding and disagreement between dentist and doctor—a state of misconception between them, that it was rarely possible to see them agree. It took the X-ray, as Dr. Heymann has said, to bring us to a realization that doctor and dentist are both commonly bent on securing the identical result. The greatest good I have been able to see, is the interrelation and correlation between the two professions, in that large numbers of cases, that formerly often went on to arthritis deformans. Many of these patients, we now believe, came to be hopelessly helpless by reason of a neglected state of mouth and tooth hygiene.

Curran Pope, Louisville: This is a most excellent paper and the subject is very timely. We should never get away from the clinical side of a case and endeavor to throw the diagnosis upon any single factor in that particular case, whether it be dental sepsis or not. My personal observation, which has been fairly large, has led me to believe that any condition of the gums or teeth is apt to be designated as pyorrhea rather than to make a distinction, as the doctor has done, between pyorrhea and many other conditions in the teeth and in the gums.

I have seen and have endeavored to read a great many radiograms of the teeth, and I tell you it is no easy matter reading them offhand and deciding as to whether the teeth should or should not be removed.

The essayist has spoken of the swing of the pendulum to one side and another has spoken of the benefit of the extreme swing of the

pendulum. I think the time has come when we must strive to strike the happy medium which represents science and sanity in these things, and it is a careful study of each individual case that leads to that result. I will go one step farther and say that I do not believe the removal of the cause is in any sense of the word sufficient. Any patient who has suffered for a long time from oral or any other sepsis, I care not where it may be located, is not likely to be immediately relieved from that sepsis by simply removing the focus from which it started. There is no question that where a focal or other sepsis has existed for any length of time, and these cases represent not acute sepsis, but represent long continued chronic sepsis, there is a metabolic disturbance; that there is a systemic general disturbance of the tissue that in itself requires very great care and very great attention in order to bring about restoration to health. While it is dangerous to reason by analogy, still no one would be willing simply to remove a cinder from an inflamed eye and turn the patient loose; neither should we remove the focus of sepsis in a mouth and expect the patient to get well. Frequently these cases reach a point where they have weak cardiac muscles, they have a bad circulation, they have infection of the entire gastrointestinal tract from one end to the other, and I believe to think you are going to relieve a long standing sepsis of the body by removing teeth is a very poor explanation to me. I may be all wrong, but that is the attitude I take, and oftentimes these patients have not gotten well following the removal of the teeth because the general systemic and infective condition of low grade is overlooked.

Arthur T. McCormack, Louisville: I wish to congratulate both professions that we can have a representative of the dental profession here before this Association to present to us so learned a paper, thoroughly practical, as the one which Dr. Heymann has presented to us this evening. It is a pleasure to testify to the real worth of that sort of work in the case of Dr. South, who asked me to tell about her own case as she would like you to know about it. She had just this type of infection from a small piece of a root which was left in her jaw years ago, and upon its removal the streptococcus viridans was found in pure culture by Dr. Heymann, and successful treatment by him has resulted in her constant and continual improvement, and she is now practically relieved. This has occurred in quite a number of cases sent to Dr. Heymann recently, and it is a pleasure to be able to see the high grade of work that is being done, and what has impressed me most in connection with his work is not simply to find pyorrhea or

infection, or a defective condition of the teeth that requires removal, but his efforts at conservation of the teeth. This phase of the work will do an enormous amount of good.

C. W. Dowden, Louisville: I feel I can quite sympathize with Dr. Heymann in coming before you twice within the last year. I have been invited to talk to the dentists in Louisville and the State of Kentucky on the same subject, and I know just how he feels as a dentist in coming before a number of doctors as I know how I felt when I appeared before dentists.

I attempted to present a statistical study of 100 cases of oral sepsis, and at the same time to parallel the various systemic disturbances found in connection with oral sepsis. Our conclusions at the time were that many cases of so-called idiopathic anemia could be traced to diseases or infection in the mouth, to various rheumatic conditions, to virulent heart infections. We concluded, however, that the diseases of the stomach and gall bladder could be explained in a much better way than that of oral sepsis.

I cannot quite agree with Dr. Solomon that although the swing of the pendulum has been too far in the other direction, that it has benefitted rather than harmed the majority of people. To illustrate the point, three or four years ago, when we began to learn about oral sepsis, and there were a great many constant features in connection with rheumatism and oral sepsis, I had a young man report to me with a typical arthritis, and we found some bad teeth, and these teeth were extracted, and the symptoms melted away as they had done frequently before. A month later I had a patient come to me, from the same section, with vague gastrointestinal disturbance who had every tooth in his mouth extracted, believing it was advisable for the purpose of curing the gastrointestinal condition. The man had every tooth, which was perfectly sound, sacrificed in the hope of getting rid of the gastrointestinal condition. That has happened dozens of times, which simply means that if we hope to get results from these cases of oral sepsis we must be able to select those which are producing constitutional disturbance and let the others go.

As to rheumatism, it is quite true that various joint diseases are due to foci of infection in the mouth, but how many of you gentlemen have, after having the sinuses x-rayed, the eye, the ear, nose and throat, men clear these up, having abscessed teeth removed and pyorrhea treated and yet the patients go on with their arthritis until you put them to bed, correct their diet, irrigate their colons, and do other things before the patients get well? There are

many more features in connection with oral sepsis than a great many practitioners imagine, and particularly in the cure of rheumatism, and where one patient gets well, there are five who do not get well and require something more than the extraction of teeth.

As to the use of the x-ray, we have x-ray work done routinely on all patients. We do not, however, depend upon our own interpretation of the x-ray plates. I believe if the doctor does make a plate, the film should be submitted to a dentist for interpretation, and no tooth should be extracted on the word or interpretation of the physician.

I recently had a patient come to me with films taken by a doctor in a distant city, and two doctors had interpreted the condition as apical abscess, and advised this patient to have the teeth removed. Before allowing him to do that, I submitted the same films to three dentists in Louisville, and they told me they were unformed apices, and it was a crime to sacrifice such teeth. I am satisfied numerous healthy teeth are sacrificed which should be saved. A patient should not give up his teeth, or her teeth, until they are actually a source of infection. Furthermore, given a patient who has cardiac lesion, a joint disease or what not, and that same individual has no apical abscesses that can be demonstrated radiographically, yet if they are suspicious, I would say have all the suspicious teeth removed in a case of that kind.

C. Z. Aud, Cecilia: Do you believe in presentiment? I want to tell you that in Hardin county we had a presentiment. We knew this thing would have to come up, so we organized a combined society more than a year ago. The dentists have united with us in the three counties of Grayson, Larue and Hardin. The lawyers are coming in with us, and we succeeded at our last meeting in inducing some of the ministers to come, and we brought up the subject of preventing the spread of the specific diseases. We so impressed these ministers that they acknowledged they had neglected their duty.

Dr. Solomon, will you please rise and tell the members of the Association what the ministers said. We knew this was coming up and we wanted to get ahead of you.

When a fight was necessary for the establishment of a decent fee in the insurance business, we had anticipated you there, and we began to fight for a better fee in the Hardin County Medical Society: when it became necessary to establish district societies, we established another district medical society, the first in the state; The Muldraugh Hill Medical Society.

When I go home I am going to ask every member of the Hardin County Medical So-

ciety to talk about this program, and I am going to question them as to what they have found beneficial in every paper on this program, and those other fellows who are not here will tell why they did not come here to get the benefits of something in every paper presented at this meeting.

Leon L. Solomon, Louisville: I preached one sermon yesterday, at the request of Dr. Aud, on the subject of venereal diseases. The doctor would now have me address myself to the question of benefit, which comes from a closer relationship between the dentist and the doctor. I made plain, in a previous discussion, the good to both professions, which a better understanding between doctor and dentist means. Now we have gone another step forward, at Dr. Aud's suggestion. He has gotten the lawyers in his midst to join certain medical societies. Thus will we be assisted in better collecting our fees. His next step will be to enlist the cooperation of the ministers, who by praying for our eternal salvation will assist us in the time to come.

Dr. Heymann (closing the discussion): In regard to the swinging of the pendulum to the extreme, while I believe it has done more good than harm, yet I do believe that it is now time for us to be a little more careful and to try and strike a happy medium in our determination of other causes of disease in order to obtain better results and thereby not sacrifice teeth as we have in the past.

One gentleman spoke of many conditions in the mouth that were called pyorrhea. That brought to my mind one condition that we have today that was not referred to in my paper, which I would like to bring to your attention, if it be permissible. It is a condition which may cause local lesions in other parts of the body, or may be systemic in its effect. I refer to so-called Vincent's disease, which is commonly known as trench mouth. It is very prevalent and has been since the return of our soldiers from overseas. It is a diseased condition of the gums caused by the action of two organisms, Vincent's spirochete and fusiform bacillus. In the acute stage it may cause an ulcerated condition of the gum margin. The ulcerated condition will usually disappear in most cases by the application of a small amount of iodine. However, the germs are not destroyed and may invade the peridental tissue and may not cause typical symptoms for six months or a year, when we have what I term for lack of better phrase, Vincent's pyorrhea. We may have this latter condition without the tissues ever having ulcerated. Such patients are often referred to me for pyorrhea treatment, and on making a smear I find it filled with Vincent's spirochete and fusiform bacilli. How many dif-

ferent conditions are associated with this disease, we do not know. I have seen, for instance, albuminuria which has disappeared following the treatment of Vincent's disease.

Dr. Dowden spoke of reading a radiogram of an unformed abscess. That phase of the subject has been brought to our attention in numbers of cases where we find a large rarified area which has been mistaken for an abscess. We may find a rarified area with the pulp alive which has been caused by trauma. When a patient closes the mouth one tooth may strike before the others and give rise to traumatism as a result of mastication. This disease can be easily eliminated by grinding the tooth surface to the proper occlusion.

ESOPHAGOSCOPY AND BRONCHOSCOPY IN DIAGNOSIS AND TREATMENT.

SAFE RULES TO FOLLOW IN EMERGENCY CASES. *

By GAYLORD C. HALL, Louisville.

The purpose of this paper is not to present the purely technical aspects of this subject, though they are difficult enough, but rather to show to the general practitioner the possibilities of this branch of surgery and to formulate certain rules or principles governing the early conduct of cases within this category.

By bronchoscopy and oesophagoscopy or endoscopy, as it is called collectively, is meant the direct inspection through the natural openings of the upper air and food passages.

This inspection may be carried out for the purpose of diagnosis, as in suspected tumors, abscess formation, etc., for the removal of foreign bodies lodged therein or for the purpose of treatment.

To carry out these procedures special instruments are necessary. These are hollow metal tubes of various sizes carrying an electric lighting attachment either on their distal or proximal end. These two groups of instruments are characteristic of the teachings of two great schools. The instruments with the lights on the proximal end are of the German pattern and designed by Gustave Killian and his disciples, while those with the light at the distal end are of American origin and were designed largely by Chevalier Jackson, now of Philadelphia, the foremost American exponent of this art.

*Read before the Kentucky State Medical Association, Lexington, September 27, 28, 29, 30, 1920.

Various forceps, applicators, etc., are necessary.

The modern development of this specialty has taken place practically in the last twenty years.

A few excerpts from Jackson's book will serve to indicate the historical development of this branch of surgery.

"Bozini in 1807 examined the upper end of the esophagus.

Mikulicz, in 1881, with aid of Mr. Leiter, designed an esophagoscope consisting of a tube into which an optic apparatus was slid after the removal of the mandrin used to facilitate introduction of the tube into the esophagus. He also examined the stomach with an elongated form of his esophagoscope by adding an angle and an additional prism.

Killian, in 1897, removed a foreign body from the bronchus and demonstrated the feasibility of upper bronchoscopy. Later he developed lower bronchoscopy. These were the greatest steps in endoscopy.

Einhorn, in 1902, devised an esophagoscope having an auxiliary tube made in the wall of the main tube. In the auxiliary tube was inserted a light carrier which served as a double conducting wire to carry current to the electric lamp which it carried to the distal end of the tube.

Ingals, in 1904, using separate light in a Killian tube, removed a pin from a bronchus of a woman.

Chevalier Jackson, in 1904, combined the lighting principle of the Einhorn esophagoscope with the tube of Killian, and in 1905 he designed a bronchoscope in which, in addition to the auxiliary canal a drainage canal was placed. In 1906 he described a gastroscope he had devised and reported a series of fourteen cases in which he had obtained results from gastroscopy, including twelve cases with lesions, one in which a lesion could be positively excluded, and one case of extraction of a foreign body from the stomach."

While the earlier workers failed to achieve either the perfection of technique or of instruments seen at the present day, they nevertheless deserve great credit for persistently directing attention to this subject and paving the way for the modern advances that have been made.

In an address delivered before the 1919 meeting of the American Medical Association on Peroral Endoscopists and published in the November, 1919, *Laryngoscope*, Hubert Arrowsmith presents a review of the clinical history of foreign bodies in the air and upper food passages as he traced it in older literature. He points out the neces-

sity for correction of the assumption on the part of many that the old mortality of inhaled and swallowed foreign bodies was practically 100 per cent. and that there had been little or no planned action for their removal. His searching of the literature of by-gone days revealed that—and this has an additional local interest for us—as early as 1854, years before the laryngoscope had come into general use, Gross published an exhaustive work on this subject which still repays careful study. He notes the paper in 1860 by Horace Green, Father of American Laryngology, on "The Difficulty and Advantages of Catheterism of the Air Passages in Diseases of the Chest"—a work of years based on the treatment of 106 cases, and ascribes to Green the inspiration of Bennet, of the University of Edinburgh, who introduced a catheter into the bronchi of seven patients and "injected the lung" of one eleven times with a solution of silver nitrate, the courageous precursor of our present methods of endoscopic medication.

From the large field of literature, Arrowsmith has made a selection of 160 cases, in date from 1820 to 1878, which typify the usual clinical histories and outcomes in pre-endoscopic days and portrays the practices of our forefathers.

These 160 cases are summarized as follows: Foreign body in the air passages, 137; in the esophagus, 23, and two lye strictures; in the pharynx and nasopharynx, 4; indeterminate, 1. There was, of course, the same broad variety in the character of the intruding material as in our own day.

Of these 160 foreign body cases, there is the surprisingly small total of 22 fatalities, only 13¾ percent. Of the recoveries made, in 41 instances the foreign body was spontaneously coughed up at dates varying from a few hours to sixty years after its reception; in 48 there was a successful planned extraction; and in 52 there was immediate or delayed expulsion of the foreign body after tracheotomy. In all, Arrowsmith credits pioneers with a total of 62½ per cent. of operative cures in his selected list.

In the instances where the foreign body lodged in the trachea and bronchi, tracheotomy was the method of procedure, followed by the use of forceps, probes, hooks and occasionally by an instrument improvised for the particular case. Two of the selected cases in this class attract our attention because of local interest.

One was reported in 1876 in the *American Practitioner* by Dr. Brandies, who removed a thread from the larynx with the help of a brush dipped in mucilage; and the

other is the successful removal of a pebble by tracheotomy as reported by Dr. Yandell in the *Lonisville Medical News*, 1876.

In the esophageal cases, the foreign bodies were brought up by kneading, pounding on the back, by mechanically produced emesis, by bristle or sponge probang, by external esophagostomy and one record shows the use of a doubled bent wire running through a Webb catheter. Of the total of 23 esophageal foreign bodies, in 19 cases there was complete recovery.

In the light of our present knowledge, this series is, of course, not a fair presentation of the clinical history of foreign bodies, but we must admire and be inspired by the resourcefulness of our predecessors and their success in dealing with these cases when we remember their handicap of uncertain diagnosis and instruments poorly adapted to such work.

Symptomatology and Differential Diagnosis.

No attempt will be made to cover exhaustively these subjects. At most, the limits of this paper permit but a sketching of the most salient points and outstanding features of these cases.

It should be of interest to know some of the signs that lead us to a diagnosis of trouble in the air or food passages when a patient is brought to us for examination most often we are asked to determine the presence or absence of a foreign body.

OESOPHAGUS.

Pain.—Very often the patient complains of pain at some point along the course of the oesophagus where the foreign body cut or lodged in its passage downward. The points of election are the places of anatomical narrowing behind the cricoid, the crossing of the bronchi and aorta, and at the cardia.

This feeling of pain is not, however, conclusive evidence of a foreign body but may only mean an abrasion of the mucous membrane. This is shown very clearly in the analysis of my series, as thirteen cases complained of pain due to the presence of a foreign body without the offender being present.

This symptom, as well as the spasm it often induces, may be relieved by the passage of the oesophagoscope and touching the affected spot with strong nitrate of silver solution.

Dysphagia.—This varies in degree from a slight difficulty in deglutition to the absolute rejection of all substances, either liquid or solid. Usually it is limited to the rejection

of solid foods, the patient being able to handle liquids.

Regurgitation.—Associated with dysphagia is regurgitation. This likewise varies greatly in degree, dependent on the amount of obstruction occasioned by the foreign body itself and by the amount of spasm it has induced.

The amount of spasm varies greatly, being more pronounced in highly nervous individuals and in the case of sharp, irregular foreign bodies. Illustrating this phase of the subject was the case of Mrs. A. B. M., age 50 years, referred by Dr. Bernard O'Connor; seen March 25, 1920. Began one week ago after drinking very cold milk. Had severe pain in chest followed by an inability to swallow either liquids or solids. Has persisted ever since. Obstruction referred to upper part of chest. Preliminary injection of Morphine Sulphate, gr. 1-6; cocaine, locally.

Oesophagoscopy.—Stricture due to spasm seen about two inches below cricoid; gradually relaxed; tube passed to cardia; no foreign body. Tube withdrawn gradually and two ounces of liquid petroleum poured through oesophagus. On withdrawal of tube patient was able to eat without difficulty.

In making a differential diagnosis we have to consider various other conditions.

Strictures.—Stricture of the oesophagus is more than enough to make a paper by itself. Let it suffice here to detail the commoner causes; cancer, caustic substances, ulceration in syphilis and typhoid, and aneurysm.

Spasm.—Spasm induced by causes other than foreign bodies sometimes engages our attention and is often very troublesome to treat.

Finally, diverticula are sometimes encountered and must not be overlooked.

In considering all these things I wish to stress the importance of taking a careful history of the case; the age at onset of symptoms; history of the antecedent diseases such as typhoid; a Wassermann test to exclude syphilis; the history of drinking any caustic substances; a careful examination of the chest for the presence of aneurysm; the regurgitation of considerable amounts of decomposed food showing in a pouch; the amount of emaciation present and the rapidity of its appearance. the gradual rejection of various articles from the diet; the nervous condition of the individual, etc.

Finally the administration of a bismuth mixture and the taking of a careful x-ray of the oesophagus gives us the most valuable information. It will reveal the general state

of the oesophagus, the site of any obstruction, the presence of strictures and how many, foreign bodies, diverticula, etc.

No one who has done this work will begrudge the radiographer the credit that is his in making more accurate diagnosis of these cases.

In all of these conditions the passage of an oesophagoscope may be all that is necessary to establish a diagnosis and assist materially in directing a successful treatment of the case.

Air Passages.—In the air passages we are concerned almost wholly with foreign bodies. The two most prominent and constant symptoms present are cough and dyspnea.

As a rule there is a history of a choking spell. Some few cases die immediately from spasm of the glottis. More often this relaxes and the body passes into the trachea. As long as the body is in the trachea we have paroxysms of coughing with choking spells as the body is thrown against the under surface of the vocal cords. These paroxysms subside as the body gravitates into the bronchi. The right bronchus, being larger and straighter receives most of the offenders.

From now on the symptoms vary according to the shape and material of the foreign body. Inert substances, like a pebble may completely block a bronchus, the symptoms present being absence of breath sounds over the blocked area with compensatory emphysema over the rest of the lungs.

There may be little reaction excited at first.

Metallic substances, such as pins, screws, nails, etc., set up a reaction over the area directly involved and a reaction over the whole lung later.

Jackson has called attention to a sign often heard in these cases. He calls it the asthmatic wheeze that is elicited as follows. Place your ear to the patient's open mouth and instruct them to breathe. A peculiar wheezing sound is heard.

In contrast to the metallic and mineral substances organic bodies, such as peanuts, beans, corn, etc., tend to excite a decided reaction. Of these, peanuts are by far the most severe and cause a wide spread, often fatal bronchitis. Jackson called attention to this trouble in a recent article in the *Journal of the American Medical Association* and termed it arachidic bronchitis.

In conclusion he says: "The pathologic condition consists of an edematous, purulent laryngotracheobronchitis which, if not fatal, results in lung abscess.

The symptoms are due to (a) the swelling of the mucosa of the air-passages, resulting in dyspnea and cyanosis, and (b) the accumulation of the difficultly expelled purulent

lung secretions, and the absorption of toxins therefrom, which result in fever and other signs of toxemia. The condition must be differentiated from laryngotracheal diphtheria and influenzal laryngotracheobronchitis.

The prognosis is grave if the peanut is not removed. The younger children succumb quickly to exhaustion and toxemia. If the peanut is promptly removed, convalescence is usually rapid. Resistance in the older children renders the course more protracted, but lung abscess ultimately results.

The treatment consists in early bronchoscopic removal of the peanut in the cases in which there is only slight dyspnea. In cases in which dyspnea is marked, tracheotomy may be required to pipe air to the lungs and to facilitate the removal of the viscid, purulent secretions, a bronchoscopic removal of the peanut through the mouth to be effected as soon as the wound has sufficiently granulated."

Thus we see these cases pass into a septic pneumonia that involves various areas of the lung and during this period all the physical symptoms of that disease may be elicited.

The general symptoms follow the degree of reaction to the foreign body. We have an irregular temperature of a septic type, rapid pulse, sweats, irritating cough often with large amounts of offensive sputum and as a rule a decided loss in weight.

Long residence in the air passages of a foreign body induces a train of symptoms greatly resembling tuberculosis. In all cases where careful examination of the sputum fails to reveal the tubercle bacillus, a foreign body should be suspected and a careful radiograph of the chest made.

Too much can not be said of the value of a good x-ray plate in these cases. While it does not show clearly the organic substances it does show the metallic and mineral ones. It shows in addition areas of infiltration in the lung, the emphysema of the other portions, and gives us the most valuable information regarding the size, situation and position of the offender.

It facilitates rapid work and aids greatly in solving the problem of removal.

A word of caution may not be amiss. The operation for the removal of the body should be undertaken as soon as possible after the plate is made as substances may change their position in the lung, resulting in a long fruitless search in the wrong location.

Here, as in the oesophagus, the appeal to the bronchoscope is final. It involves no risk. In small children it can be used with-

out any anesthetic, either local or general, in fact it is better not to use an anesthetic. It will probably furnish information after all other methods have failed and result in a cure of the case.

All these conditions prompt me to make a plea for the early use of the instrument and shun delay as the most dangerous policy to pursue. It is most discouraging to have a patient brought to you after a long delay, greatly prostrated with weakened heart, probably septic, and with little or no resistance to endure any sort of treatment, and realize that had the case been seen early it could have been relieved promptly without risk and with scarcely any disability.

How is the best way to achieve good results in this work? Jackson in the preface of the first edition of his book states: "The time has come when not only the profession but also the public demands that every Laryngologist shall be expert at the removal of foreign bodies from the trachea, bronchi, oesophagus, and stomach."

With all due respect for Dr. Jackson's opinion, it seems to me much better, at least in this part of the country, that such work be centralized in the hands of one or two men in each community. I hope I may escape the suspicion of being selfish in making this statement because every one who has practiced this work knows that it is not especially profitable, the great bulk of the cases coming from people who can pay little or nothing for the services rendered.

My reasons for making this statement are, first, a large and rather expensive armamentarium is required; the cases are necessarily and fortunately infrequent; a certain amount of practice is necessary to keep one familiar with the technique, and in addition one must have assistants who are familiar with the work.

Therefore, if the cases are scattered out in many hands no one has enough of them to develop the technical skill and team work so essential to the successful handling of these cases and the unfortunate patients suffer the consequences.

For these reasons I believe the best results will be obtained by leaving this highly technical branch of our specialty in the hands of a few men who will consent to devote themselves to the work.

My first experience in this work dates from December 6, 1909, at which time I removed a grain of corn from the right bronchus of L. B., a six year old girl.

Shortly afterward I extracted a nickel impacted in the oesophagus of a five year old boy.

Since this time I have had a moderate experience in handling these cases. Some of my records are lost and others so incomplete that I could not include them in this study. I present for your consideration, fifty-two cases.

Analysis shows that there were twenty bronchoscopic and thirty-two oesophagoscopic cases.

Foreign bodies and suspected foreign bodies furnish the bulk of the work. There were thirteen cases of foreign body in the bronchi, twelve in the oesophagus. There were seven cases of suspected foreign body in the bronchi and thirteen in the oesophagus. There were three cases of tumor carcinoma of the oesophagus and four cases of spasm of the oesophagus, one due to peptic ulcer.

There were two failures to remove a foreign body in the bronchi; one in the case of a child age six, who had inhaled a grain of corn. Every attempt to pass a tube past the bifurcation of the trachea resulted in an arrest of breathing, so the case had to be abandoned without ever locating the foreign body. The other case was in a child of twenty-seven months, who had an ordinary pin low down in the smaller bronchi on the right side. Even the smallest tubes failed to reach the position of the pin and the attempt to extract was given up.

The first case gradually developed a septic condition and died from exhaustion after several months. In the second case the pin has excited no reaction and the baby has suffered no inconvenience.

(Note: This patient died November 8th, 1920, of septic pneumonia and exhaustion brought about by the presence of the foreign body in the lung.)

RULES.

When called to see a case of foreign body lodged in the oesophagus, inquiry should first be made as to its character. If smooth or rounded, as a food bolus, morphine should be given to relax the spasm and the older methods of pounding on the back or emesis may be tried. Reasonable attempts failing, the patient should be sent for an extraction per oram.

If the body is sharp or irregular, even the above methods should not be attempted, but morphine given to control pain and spasm and the patient sent at once for extraction.

Attempts to dislodge the offender by bougies, bristle probang, penny catchers, or forceps are mentioned only to be condemned. Working in the dark without knowledge of the shape, size, character, or position of the foreign body can result only in harm. It

may produce a rupture of the oesophagus with fatal mediastinitis.

In the air passages the immediate problem is solely one of dyspnea. If the patient is quiet, breathing easily, without any distress, it is far better to make no attempt at extraction until an x-ray examination of the chest has been made and the body accurately located; then immediate bronchoscopy.

If the case is in distress and suffering markedly from dyspnea an immediate tracheotomy should be performed with whatever instruments are at hand. This may relieve the dyspnea, lessen the strain on the heart, and even bring about the expulsion of the foreign body as can be seen by studying the cases collected by Arrowsmith.

Signs of marked distress in recent cases usually mean that the body is still in the trachea and partially blocking both main bronchi. In such a case one has an excellent chance of securing expulsion through a tracheotomy wound.

It should be remembered, however, that tracheotomy is to be reserved for emergency cases as extraction through the natural passages is very much safer and to be preferred.

Case Reports.

Case 1.—L. B., age six years, Horse Cave, Ky. Seen December 6, 1909. On December 3rd, in afternoon, inhaled a grain of corn. Immediately became cyanosed and had repeated coughing spells. This later became less severe but from time to time would recur with strangling cough and cyanosis until brought to the hospital. Inversion of the child, patting on back, tickling throat, had been tried without avail. Seen on night of December 5th; moved to University Hospital; temperature 99; pulse 132; had heavy breathing, coarse rales over both lungs; paroxysmal strangling cough; respiration rapid but not counted.

Examination of the chest for the location of the body negative. Chloroform by Dr. Bruce; examination of the lung with bronchoscope; particle located in the right lung bronchus leading to lower lobe. The particle was swollen and soft. Attempts at removal only partially successful but most of the grain and some soft substance removed. Attempts after nearly two hours abandoned on account of general condition and presence of much mucus, interfering with examination. Put to bed with bad pulse and restless; later reacted and coughed up remaining portion of corn during night. Recovery.

Case 2.—Miss L. M. H., age about fifty years; Bloomfield, Ky. Seen with Dr. Lucas November 3rd, 1910. Disturbance in

epigastric region; difficulty in swallowing at times; disturbed digestion; sour eructations; is very fond of sweets. Oesophagoscope passed, local anesthetic; erosion at cardia; dilated and treated with nitrate of silver, 12½%. Relieved.

Case 3.—Mrs. H. V. D., Cloverport, Ky. Seen July 21, 1910; referred by Dr. Wm. Cheatham; general health good; no loss of weight; has discharge which drops from nose into throat, with offensive odor, of many years duration; loss of sense of smell. One month ago got a fish bone in the throat which was removed; a week later while drinking water something seemed to cut the throat; had moderate hemorrhage which has persisted since this time; has difficulty in swallowing any thing, cold water especially irritates; moderate nausea, though nothing is vomited. Examination with the oesophagoscope reveals a mass of necrotic tissue low down on the left side behind the cricoid; issuing of blood from area; gently curetted; no foreign body located; canterized, pure phenol. The passage of the tube revealed no lesions. Healed in seven days. Recovery.

Case 4.—B. L., 2½ years, Fort Wayne, Ind. Seen May 28th, 1914; referred by Dr. P. F. Barbour; gives history of having inhaled pieces of peanut seven weeks previously while eating candy. Since that time has had distressing cough with attacks of irregular fever; treated for pneumonia; patient has lost much weight and looks septic. Examination by Dr. Barbour revealed retraction of intercostal spaces on right side; patchy pneumonia, more pronounced on right side and behind. X-ray negative. Bronchoscopic examination revealed an abundance of secretion in bronchi that made examination very difficult. Following right bronchus downward came upon a large mass of granulation tissue which was removed. This was followed by an abundant flow of pus. The suction apparatus was placed through the tube and all secretion removed. The nut kernel was then visible; removed with forceps. After a prolonged convalescence patient gradually recovered full strength and vigor.

Case 5.—E. N., age seven years, Jefferson-town, Ky. Seen October 22, 1914, in consultation with Dr. P. R. Taylor and Dr. Rush. Has a cockle burr in larynx; became impacted late in afternoon; seen by Dr. Rush who brought case at once to Dr. Taylor at Children's Hospital. Attempts under general anesthetic to remove the body with curved forceps had failed. Inserted direct laryngeal speculum and found burr lying between the

vocal cords; removed with forceps. Recovery.

Case 6.—C. G., age six years, Waynesburg, Ky., Lincoln County. Seen November 24, 1914. Three weeks ago while eating hickory nuts got a piece of the kernel in the wind-pipe; had immediate paroxysms of coughing with pronounced cyanosis which gradually subsided; now has irritating cough; dyspnea; slight fever; general malaise; symptoms of bronchial irritation over both lungs; atropin; general anesthetic; bronchoscope passed. Removed large piece of hickory nut shell from right lung. Following this symptoms still persisted though not as severe as formerly. The father was advised that there must be additional material in the lung that had been overlooked the first time. He refused further examination. Two or three times a day the boy would have severe paroxysms of cough with cyanosis. About the sixth day patient coughed up a small partiele of hickory nut shell, after which all symptoms subsided and case went on to recovery.

Case 7.—E. T., age eleven months, Elkhorn, Ky. Seen March 9, 1918; twenty-four hours previously child had inhaled a bean which was found lying on the floor; had immediate choking spell with labored breathing, cough, etc. Examination showed asthmatic wheeze present; absence of breath sounds on right side; compensatory emphysema left side; bronchoscopy without anesthetic; preliminary atropin; bean in right bronehus partially removed; twenty-four hours later tracheotomy, also without anesthetic, for inereasing dyspnea; temperature 103; pulse 140; respiration 60; child was cold; markedly cyanotic; prompt reaction after tracheotomy; two days later lower bronchoscopy; removal of remaining portion of bean. Patient ran an irregular temperature and had repeated attacks of cyanosis due to the tracheotomy tube becoming filled with secretions. On one occasion was called hurriedly to hospital at mid-night because nurse thought child was dying; found patient practically lifeless; removed tracheotomy tube entirely; artificial respiration; atropin; heat; adrenalin oil instilled in trachea; patient finally rallied; after this tracheotomy tube was left out entirely with much betterment of breathing; tracheotomy wound closed in ten days; child returned home. Recovery.

Case 8.—A. J. B., twelve months, Louisville, Ky. Seen December 8, 1919; consultation with Dr. Kerwin; patient has a hinged collar button impacted in the oesophagus behind cricoid; one week duration; x-ray by Dr. Kerr; great difficulty in breathing; handles feeding with difficulty. Removal by

oesophagoscopy without anesthetic; membrane touched with nitrate of silver; liquid petroleum poured into oesophagus. Recovery.

Case 9.—E. H., nine years, Dunville, Ky., Casey County. Seen March 6, 1919. Five days ago inhaled some parched corn; has decided cough, moist rales over both lungs; temperature 100; marked obstruction to breathing on the right side; atropin; ether anesthesia; passed bronchoscope; removed three grains of corn from right bronchus; slight reaction followed by bronchial irritation persisting five or six days. Recovery.

Case 10.—L. M. B., age eleven months, Church, Ky., Grayson County. Referred by Dr. Armes, Leitchfield, Ky. Seen November 8, 1919. Twenty-four hours previously, while playing on floor where some loose beans were, put some in mouth. Had momentary choking spell which subsided; has little reaction and cough; no physical signs in chest; no wheeze; x-ray negative; bronchoscope passed; bean found in right bronchus; removed. Recovery.

Case 11.—Baby Smith, age two years, Buechel, Ky. Seen January 3, 1920, in consultation with Dr. Dyer. A few hours previously, while crying, inspired a mouthful of partially chewed peanuts; had immediate choking spell with cyanosis; later became quiet. Examination shows labored breathing; asthmatic wheeze; obstruction over both lung areas; prolonged expiratory murmur; atropin; no anesthetic; bronchoscope passed; a number of peanut kernels and husks were removed; during operation slight swelling of eyelids noticed; patient returned to room in fairly good condition; air in both lungs; though breathing was still harsh it was without effort; died three hours later, following a severe spell of retching and vomiting; generalized emphysema; diagnosis, rupture of lung.

This is my only fatality in my series that could be associated in any way with the instrumentation and I am not at all certain that the operation had anything to do with the outcome, though I admit it remains as a possibility.

DISCUSSION

J. A. Stucky, Lexington: I am very glad to add my mite to the splendid paper read by Dr. Hall. He has given all of us food for thought. One thing he did not mention that I want to emphasize, namely: I wish very much the Kentucky State Medical Association would take some action in regard to this, and that is, the danger to the esophagus caused by "the careless leaving around" of lye in the kitchen. Dr. Cheva-

lier Jackson and myself several years ago brought this before the American Medical Association. Some of the most pathetic, some of the most hopeless cases of esophageal trouble I have ever seen have been the result of a child getting a piece of lye, swallowing it and bringing about a condition that we cannot relieve. As public health officers, and every physician is a public health officer, we should warn our households of the danger of leaving poisons, such as lye, where children may get hold of it.

Sometimes the x-ray is misleading as to the exact location of the trouble. One should get an x-ray as soon as possible in order to know what and where the trouble is. In other words, do not go into the esophagus, or into the trachea unless it is an emergency, without having a good idea of what is in there and where it is. One of the most embarrassing things that we who use this method of saving life have to contend with is the traumatism that exists as the result of efforts having been made to extract the foreign body either from the esophagus or from the lower pharynx or from the larynx before we see it. I may mention briefly three cases. The first case came under my observation a few months ago, and it happened to be a large "bachelor button" in the lower third of the esophagus. The fluoroscope showed it at junction of middle and lower third. The child was crying at the time this was used, and the foreign body was clearly seen. I introduced the esophagoscope, got hold of the bachelor button, started to extract it, and found the thing was open, and if I pulled it I would have made a rent in the esophagus, and there was no way I could close the ratchet on the button. If I had pushed it down I would have torn a hole in the esophagus. So I had to resort to dilation of the esophagus with a probang and push it into the stomach. I knew a general surgeon would have a better chance to save the child than I would have with that open-ratchet bachelor button. I pushed it into the stomach. By some means it was closed after reaching the stomach, for it was passed the next day and was removed by Dr. McClymonds, from the rectum. Had I made an effort to remove that foreign body without seeing what was being done, I would have done an irreparable injury.

I want to report another case where the x-ray did not help. This child was panting for breath and something had to be done quickly. Every indication pointed to the fact that the larynx was blocked up. Introducing the laryngoscope and bronchoscope I saw clearly that there was edema of the glottis. Pushing my tube through very carefully, I did what I could to afford relief. The x-ray had shown nothing the matter with the child, but the mother was positive the child had swallowed a coffee bean. I pushed the

instrument as far as the bifurcation and could not find the foreign body. When the child came out from under the anesthetic it was relieved, and I suppose the introduction of the tube relieved the edema of the glottis. At the end of two or three days the child went home, had no fever, no reaction, but in about three weeks coughed up the coffee bean. The child is well.

The third case I saw a few days ago, a pathetic case because the termination was fatal. The child was four years of age, had swallowed a foreign body, a coin, which lay in the esophagus for a week or ten days. A radiogram showed it clearly at pharyngeal oesophageal opening, and it seemed as if all one had to do was to remove it. My son said that he could get it with forceps and remove it. He made an effort to do so but did not catch it. Going in very carefully as soon as forceps touched the coin there was a gush of blood. Another x-ray was made two hours afterward. The child in the meantime was resting. Two or three hours later the penny was in a different position. Instead of being vertical, this way, (indicating), it was flat. Through the esophagoscope it was easily lifted out, but it had been in this position so long, several hours, the neck of the child began to swell. There was emphysema. The penny had eroded through the esophageal wall into the upper tracheal wall, and when it was lifted out I could see it clearly—the erosion. With the rush of blood I felt sure that something serious had happened, yet there was so little force used. The child died in eight hours.

This is one of the most important and most delicate things that the medical man has to contend with, and the safest thing the general practitioner can do, and the greatest help he can give, especially to the man who is going to try and extract the foreign body is to keep the child quiet until an examination can be made, the foreign body located, and got at and work by sight instead of the sense of touch.

S. S. Watkins, Louisville: Dr. Hall is to be congratulated on his paper, which has well covered the subject. There are a few important points that should be mentioned again by way of emphasis. One is the choice of anesthetic. As Dr. Hall said, it is well to try to avoid anesthesia, particularly in young children, because they do not stand these manipulations well and the shock of the anesthetic, especially a general anesthetic (which is necessarily deep in order to overcome the reflexes of the throat) adds greatly to the danger in the case. Children do not take cocaine well, and it should not be used in their cases. Sometimes in an adult, especially when nervous, one can make one or two applications with a ten or twenty percent solution of cocaine, but it is important to avoid repeated applications. In cases of dyspnoea, avoid gen-

eral anesthetics and morphia. The former paralyzes the accessory respiratory muscles, which the patient is using to breath, and morphia adds to the depression of the respiratory centers.

Another important point, I think, is the duration of the examination or operation. Dr. Chevalier Jackson, the great master in this country in esophagoscopy and bronchoscopy, has laid down some good rules in regard to the duration of these procedures. They are: A child under one year of age should not be examined for over fifteen minutes; from one to five years, not over twenty minutes; from five to ten years, not over thirty minutes; in young adults, not under anesthetic, the examination may extend to forty-five minutes or even an hour and a half. It is always well to have a hard and fast rule and never vary from it. By prolonged manipulation, one may very easily kill a patient, when by postponement for a few days and by study of the case in the meantime, he will, usually be able to remove the foreign body without difficulty.

Several important points in the technique are: Do not pull upon a sharp object until the point is straight within the bronchoscope or esophageal tube. Another is, never use force. Gentleness is absolutely necessary in these cases. Work around the object and try to get its long axis parallel to the tube. It is very easy to tear the tissues as they are very delicate.

When a patient has a malignant growth of the oesophagus and is losing weight, it is best to go ahead and do a gastrostomy and to use radium externally. He will live a surprisingly long time if the growth is an endothelioma. These patients may live two or three years.

The preliminary use of the x-ray, and the use of the fluoroscope, previous to instrumentation, cannot be too strongly emphasized, and it is absolutely necessary unless a patient is suffering from intense dyspnoea.

Spasm of the crico-pharyngeus muscle is frequently due to ulcers in that region, and it is the most frequent cause of "globus hystericus." The term "cardio-spasm," according to Dr. Jackson, who has made a special study of this condition is a misnomer. No constriction of any kind exists at the cardia. It is at the diaphragmatic opening that the spasm occurs and esophagismus is a better term. As a rule, it is secondary to an ulceration, a foreign body or growth in that region.

Leon L. Solomon, Louisville: I would like to ask Dr. Hall, in closing the discussion, to address himself to the question of Cough, accompanying foreign bodies in the air passages. I have in mind two cases, exhibiting extremes. One was a lad, referred to, in the discussion on x-ray revelations, I believe, yesterday. He had a pin in the right bronchus for two weeks, during which

time we were making efforts, as suggested by Dr. Watkins, to remove it. This boy never had a single symptom in his right bronchus. He did not cough; he had no pain or irritation; he had no rise of temperature and no discomfort.

I have in mind another case, a child, four years of age, with a pin in his bronchus. This child started to cough and continued to cough until it exhausted itself and died of a combined respiratory and cardiac failure. These are two extremes, as we see extremes in clinical medicine.

G. C. Hall (closing the discussion): I want to thank the gentlemen who have taken part in the discussion. I would like to supplement the warning Dr. Stucky gave about caustic substances being left carelessly where children can get hold of them. Doctors ought moreover to instruct their clientele not to give small children peanut candy and roasted peanuts to eat; for they furnish the bulk of our fatalities when it comes to foreign bodies in the lung. There is nothing comparable to the reaction that a peanut will cause in the lung. The particles are small as a rule and multiple so that it is difficult to remove all of them. In addition the substance in the kernel is directly poisonous to the bronchial mucus membrane, causing a fatal tracheo bronchitis.

All the cases we get are different and present different problems, thus bringing out the different symptoms as suggested by Dr. Solomon. As a rule, these patients cough. The reflex is excited, I should say in direct proportion as the foreign body is near the vocal chords. In other words, bodies in the trachea, bodies in the bronchi, in such a position as to pass up against the under surface of the cord, will induce coughing. Those bodies that are firmly fixed low down in the bronchi are not, as a rule, apt to cause or excite cough, provided they are metallic and do not excite a generalized bronchitis as a result of the irritation. Of course, if a foreign body has remained in the lung for a long time and has produced a generalized bronchitis, abscess of the lung or pneumonia, we have cough as a constant symptom.

I wish to thank Dr. Watkins for his remarks. I think it is a very wise plan to instruct people about giving small children peanut candy, etc.

A short manipulation not only often saves the child's life, but the interval that elapses between the first and second examinations clears things up for you. You are called suddenly in an emergency, and if you persist too long in trying to locate the foreign body and remove it, you may do a great deal of harm. There is nothing easier to do, especially in a small child, than to lose yourself in a bronchus. When you have worked fifteen minutes or twenty minutes, it is better to cease for the time being, and in making a prognosis it is a hundred times better

to quit. You can stop and in thirty-four or forty-eight hours try again. In this way you have not endangered the life of the patient by a prolonged manipulation. I think it highly important to instruct the parents of the child that we can only work on these cases for so long at a time, and that if we are not successful at first we will try again, hoping to bring the case to a successful termination.

OCULAR SYMPTOMS OF BRAIN TUMOR.*

By SAMUEL G. DABNEY, Louisville.

The ocular symptoms of brain tumor are, in the order of their frequency, (1) Affections of the optic nerve; (2) Disturbance of the field of vision; (3) Impairment of direct vision; (4) Paralysis of extraocular muscles; (5) Nystagmus; (6) Pupillary symptoms; (7) Exophthalmos.

FREQUENCY: (1) Disease of the optic nerve is said to occur in from seventy to ninety percent of brain tumors, but Cushing is probably right in saying that "choked disc, when present, is doubtless one of the most valuable signs of tumor, but it must be constantly borne in mind that it is absent in all cases at an early period, in most cases until a late period and that many tumors have a long life. Tumors allowed uninterruptedly to run their full course will all probably show a certain stage of choked disc before the end." These remarks do not apply to pituitary disease in which visual symptoms are often the earliest and the only sign. Moreover, in regard to tumors elsewhere the proportion of choked disc varies with their site. Gowers believed that tumors of the cerebral substance were more apt to cause nerve disease than tumors of the meninges. This is said to apply to gummata in the two situations also. Tumors in the posterior cranial fossa generally present early choked disc.

(2) The field of vision may reveal (a) increase in size of the blind spot; (b) irregular or concentric contraction; (c) homonymous hemianopsia; (d) bitemporal hemianopsia; (e) central scotoma; Mononymous hemianopsia occurs according to Uhthoff in eighteen percent of brain tumors. A year ago a young man in the early 30's consulted me on account of headaches, fainting spells and disturbed sight. He had vision of 20-20 in each eye, but well marked optic neuritis in both eyes and right sided homonymous hemianopsia. A large tumor was removed by

Dr. Cushing from the left side of the brain. The young man looks well and is actively engaged in business. The color fields are often affected before the fields for form.

(3) Direct vision may be perfect with marked ophthalmoscopic changes, may be slightly reduced or may be totally lost. A little girl of thirteen and a lady of thirty both consulted me for glasses to relieve headache. Both had bilateral optic neuritis and brain tumor. The child was operated on in this city, but died. The lady refused operation and died in convulsions.

(4) Paralysis of extraocular muscles occurs in 34 percent of brain tumors—the third and sixth nerve being effected with about equal frequency.

(5) Nystagmus is most common in cerebellar tumors—I find no statistics as to frequency.

(6) Pupillary symptoms and (7) Exophthalmos are rare.

TIME OF OCCURRENCE: Disease of the nerve and other ocular symptoms are absent in the early stage and De Schweinitz says may not occur for years—Cushing seems of this opinion also. As already stated, disease of the pituitary body is an exception to this rule.

OPHTHALMOSCOPIC DIAGNOSIS: The typical picture is well marked bilateral choked disc—the latter term signifying an elevation of the disc of not less than 2 D. (Horsley believes choked disc always begins in the upper nasal quadrant.) But there are many variations from this picture. Only one eye may be involved for a long time (in two of my cases for over a year) and Huggings Jackson states that the nerve may be inflamed with or without choked disc. In one of the long-mono-lateral cases just mentioned, there was only a mild neuritis which went on to blindness, the other eye finally having the same fate.

The patient, a youth of twenty, had early and marked parosmia. Postmortem showed a tumor as large as a small orange near the base of the brain. Two conditions may be confusing in diagnosis—pseudo neuritis and nephritic neuro-retinitis. Pseudo-neuritis occurs in hypermetropia generally with astigmatism. Beard reports a case in which the hypermetropia was 13 D at the disc and only 4 D at the macula, and in which violent headaches and vertigo were among the symptoms. The patient was under observation twenty years and no change in the eyes took place.

The condition is diagnosed by the facts that there is no change in the blind spots or fields, no change except tortuosity of the vessels, no visibility of the optic nerve fibres and

*Read before the Louisville Medico-Chirurgical Society.

especially no hemorrhages nor infiltration in the retina.

In neuro-retinitis of Bright's disease, though the star figure at the macula may be produced also by brain tumor, the disc is not so steep and the vessels do not bend over. Of course the two diseases may co-exist. I saw one such case in consultation with a general surgeon and leaned in my diagnosis to brain tumor which the subsequent history confirmed. Should there be a mild neuritis in the two conditions ophthalmoscopic diagnosis would seem impossible.

As regards pituitary disease, Benedict of the Mayo clinic, made a most interesting report on thirty-two cases at the last meeting of the A. M. A. He emphasized the facts that bitemporal hemianopsia, with or without impaired vision, may occur months and even years before ophthalmoscopic change; that one or both eyes may be affected, usually both; that the characteristic change in the appearance of the disc usually comes about four months after the visual impairment and consists of a waxy pallor over the whole disc, not confined to the temporal half—and that later atrophy takes place. In most of his cases there were no constitutional symptoms. Bitemporal hemianopsia occurred in twenty cases, blindness in one eye and impaired temporal field in the other in ten and homonymous hemianopsia in two. Several years ago a vigorous looking man in the early 30's consulted me for his sight—one eye was blind with atrophy of the nerve and the other had 15-200 vision with loss of the temporal field. Dr. Cushing operated on his pituitary and for several years at least the progress of his blindness was arrested. Benedict thinks oculists too prone to pronounce pallor of the disc and impaired sight due to tabes and that in the future we will discover more cases of pituitary disease.

Pathogenesis: The ocular symptoms of brain tumor are in the main due to direct or indirect pressure caused partly by the growth of the tumor, partly by increased cerebrospinal fluid. De Schweinitz and Frazier maintain that an inflammatory condition also exists. This was apparently Hugling Jackson's opinion too and is born out by my little experience.

LOCALIZING VALUE OF OCULAR SYMPTOMS: It is often said that choked disc has no value in localization, and this is true in the sense that tumor anywhere in the brain may produce it. It is most early in cerebellar tumors. Horsley was of the opinion that the tumor lies on the side of the eye first affected and though not universally agreed to this view seems correct. Homony-

mous hemianopsia most often indicates a tumor in the occipital region opposite to the lost field, but may be caused by direct pressure on the optic tract. Bitemporal hemianopsia generally indicates pituitary disease, but may be rarely caused by downward pressure of a distended third ventricle. Paralysis of third and sixth cranial nerves with optic neuritis generally indicates a basal lesion according to Arnold Knapp. Paralysis of abducens alone is said to be caused by distant pressure and to have no localizing value, though Knapp states that when found in cerebellar tumors it is on the same side as the tumor in seventy-five percent of cases. Atrophy in one eye and choked disc on the other indicate tumor on the side of the choked disc. Central scotoma may indicate pressure on nerve or chiasm. Exophthalmos is usually due to involvement of the orbit but in rare cases may be caused by compression of the cavernous sinus according to Arnold Knapp—this was perhaps the cause in the case of pituitary disease I recently saw with one of my colleagues and which has since been operated on.

DISCUSSION

A. Shelton Watkins, Louisville: I have been asked to discuss the diagnosis and localization of intra-cranial lesions from the standpoint of the vestibular, or so-called Barany, tests. The value of these tests in this field is a much debated subject. On one side, Cushing considers them of some help in tumors of the acoustic nerve, less so in new growths of the cerebello-pontile angle, and of little or no value in intra-cerebellar tumors. On the other side, Jones believes that by means of these tests he can localize lesions in the brain stem and cerebellum. The latter, in his book, "Vertigo and Equilibrium," has reported a number of cases in which he says these tests were of diagnostic value; and from this clinical evidence he has presented in explanation of his claims a very interesting theory of the innervation of the semi-circular canals.

It is worth while to describe briefly the imaginary nerve paths that Jones has charted in his book, because it is along their courses in the brain stem and cerebellum that he claims to be able to localize lesions by means of several symptom-complexes and the results of the vestibular tests. He says that there are two separate nerves from each static labyrinth to the brain, one from the horizontal canal and the other from the vertical canals, and that each nerve divides within either the medulla or pons into two sets of fibres, one carrying the impulse which produces nystagmus, and the other the impulse which produces vertigo. The nerve from the horizontal canal enters Dieter's nucleus in the

medulla. From there the nystagmus fibres go to the posterior longitudinal bundle and finally connect with the nuclei of the third and sixth cranial nerves. The vertigo fibres go through the inferior peduncle to the cerebellar nuclei and from there through the superior peduncle and nuclei ruber and albus cross to the temporal lobe of the opposite side of the cerebrum. The nerve from the vertical canals ascends to the pons before dividing. From there the nystagmus fibres go to the posterior longitudinal bundle and eventually connect with the nuclei of the third and fourth cranial nerves. The vertigo fibres go to the cerebellar nuclei through the middle peduncle and from there through the superior peduncle and nuclei ruber and albus cross to the temporal lobe of the opposite side of the cerebrum.

There is anatomic proof for only one of these paths, viz., the one which enters Dieters' nucleus in the medulla and from there goes to the cerebellum through the inferior peduncle. This was discovered by the Spanish anatomist, Ramon y Cajal, in 1909. The other nerves are purely hypothetical and no anatomic evidence of them has been produced.

The turning and caloric tests are the only ones commonly used in testing the static labyrinth and its nerve. There are two other tests which are occasionally made, but as they are applicable only in special cases I will not describe them nor will I attempt to explain the reflexes and reactions produced by these tests, because such would consume too much time.

In the turning test the patient is placed in a revolving chair and turned around ten times at the rate of one revolution in two seconds, and then the chair is suddenly stopped. Nystagmus, pointing error and falling occur according to the position of the patient's head. The nystagmus usually lasts from fifteen to thirty seconds. The turning and sudden stopping causes a movement of the endolymph and the current thus produced stimulates the nerve end organs in the semicircular canals. It is necessary to put the various canals in the horizontal plane to stimulate them. To put the horizontal canal in the horizontal plane the patient's head is bent forward 30 degrees; to put the vertical canals in the horizontal plane the head is bent forward or backward 90 degrees and face rotated 45 degrees toward one shoulder.

In the caloric test cold or hot water may be used, but the former is preferred because it is less unpleasant to the patient. The entire external auditory canal is irrigated with water at 68 degrees, F. It is necessary that the water come in contact with the tympanic membrane. This chills the static labyrinth after about thirty seconds and causes condensation of the endolymph. Thus a current is produced which

stimulates the nerve end organs. Nystagmus, pointing error and falling are produced according to the position of the patient's head. It is necessary to put the canal or canals stimulated in the vertical plane to stimulate them. Thus with the head upright the vertical canals are stimulated; with the head backward 60 degrees and face 45 degrees toward the side to be examined the horizontal canal is placed in the vertical plane. The caloric test is a more definite test in most cases than the turning test because only one ear is stimulated at a time and it is a more delicate stimulus.

These tests are poorly understood and we must be cautious in drawing conclusions from them. Jones is, I think, too enthusiastic and has gone too far in his claims. I recall that several years ago in Baltimore he was asked to localize a brain tumor by means of the vestibular tests, and that while he correctly placed it in the cerebellum, he put it on the wrong side as proved at operation. It is, of course, unfair to draw conclusions from one case, but the fact that the lesion was on the opposite side makes one think there was more luck than accuracy in localizing it in the cerebellum. It is, obviously, of decided advantage at operation to know which side of the cerebellum is involved. So far as I have been able to determine from reading his book, Jones has not given the number of cases examined from among which he selected those reported. He should, I think, report this number and also the ones he failed to diagnose. Then we could figure the percentage of correct diagnoses and determine accurately the value of these tests in cerebellar lesions.

I am inclined to accept Cushing's opinion that the vestibular tests are most useful in tumors of the acoustic nerve, and of little value in new growths elsewhere in the posterior fossa.

L. Wallace Frank: I am very glad to have had the privilege of hearing Dr. Dabney's paper. This is a subject which can never be sufficiently discussed nor has enough emphasis been placed on the importance of the ocular findings in brain lesions.

In regard to the Barany tests as used by Jones in this country: I have had the opportunity of seeing Jones and his assistants do some of this work, and while we did not have a sufficiently large series of cases to come to any definite conclusions, we believe that the method is of value. Certainly in some of the cases operation proved the lesion to be in the place stated. On the other hand I have seen cases operated where very positive findings of subtentorial involvement were secured by the turning test but no tumor found. It is my belief that these cerebellar reactions were due to pressure from marked internal hydrocephalus, or direct pressure from a tumor above the tentorium.

As a differential diagnostic point in brain tumors the question of choked disc is one of great importance. As Dr. Dabney has stated, if a patient with brain tumor lives long enough, choked disc will develop. Choked disc usually occurs early when the tumor is close to the ventricular system and by its growth causes obstruction to the outflow of cerebro-spinal fluid and consequent internal hydrocephalus. In other cases the tumor may grow to enormous size and unless there is pressure directly on the nerves or obstruction of the ventricular system, choked disc does not occur. The value of choked disc, as Dr. Dabney has also mentioned, is the fact that in tumors of the posterior fossa the choking appears as a rule first on the side of the lesion. Another characteristic of the choked disc in this kind of case is its rapid appearance and progress, and within a week or even less the choking may increase from 2 to 7 diopters. Furthermore, in these cases choking of the disc is usually higher on the side of the lesion.

Another important point in the eye findings of brain tumor is bitemporal hemianopsia, which is noted in pituitary lesions where the tumor encroaches upon the optic chiasm, causing paralysis of the nerve fibres which go to the nasal side of the retina and give temporal blindness on both sides. Cushing is of the opinion that one of the early symptoms of pituitary tumor, even before the development of bitemporal hemianopsia, is disturbance and interlacing of the color fields.

In tumors of the occipital region it is necessary not only to examine the fundus but also to examine the visual fields most carefully. Neoplasms in this region often give quadrant defects, and we learn whether the lesion is above or below the calcarine fissure.

I have not seen any brain tumors which caused unilateral exophthalmos, but have seen an aneurism of the internal carotid artery which caused exophthalmos on the same side. However, I do not see why a brain tumor which obstructs the cavernous sinus should not cause unilateral exophthalmos for such does occur in cavernous sinus thrombosis.

Adolph O. Pfingst: In speaking of the eye symptoms of brain tumor, I can not refrain from saying a word about Helmholtz, the discoverer of the ophthalmoscope. Helmholtz, as you no doubt know, was not a physician but a physicist. He did much in the development of the physiology of hearing and sight and not least of his contributions to the medical profession was his discovery of the instrument by which we are able to see the background of the eye. This has enabled the oculist to refract and recognize diseases of the eye; the internist to make early diagnosis of renal and nervous diseases

and has given to the surgeon an important aid in diagnosis of brain tumors.

I do not believe statistics are correct when the presence of optic neuritis in brain tumors is placed at ninety per cent of cases if we consider brain tumors as a whole which includes tumors of hypophysis and of the anterior lobe. In tumors of the cerebellum and of the temporo-sphenoidal lobes I do believe that ninety per cent are accompanied by optic neuritis.

It occurs to me that we have choked disc with greater frequency the further we get away from the optic nerve, the symptom occurring with greatest frequency in tumors involving the cerebellum or the cerebellar pontine angle. It is also not infrequent in growths of the temporo-sphenoidal lobe. The reason choked disc does not occur with any great frequency in tumors of the hypophysis is that the tumors press downward on the optic commissure thereby cutting off the communication between the optic nerve sheaths and the ventricles and hence prevent lymphatic pressure and choked disc. Where the pressure arises below the tentorium the ventricular fluid is displaced some going downward into the spinal canal increasing spinal pressure and some being forced forward into the lymph spaces around the optic nerve, in this way causing pressure upon the return venous circulation and a consequent choked disc. Optic neuritis or choked disc are neither an aid in judging the location or size of the tumor. The essayist has told us that the nerve is more apt to be affected on the side on which the tumor is situated. The extent of the changes in the nerve is also no index to the size of the intracranial growth, some small tumors being accompanied as choked disc while in the presence of very large tumors the nerve head may remain normal. The extent of the changes in the nerve depends more upon the location of the growth than upon its size.

Whenever a brain tumor rests upon the optic tract as the hypophyseal growths do, symptoms arise which are frequently diagnostic and readily recognized. The same is also true when the tumor involves the optic tract or the nuclei of origin of the optic nerve.

Bitemporal hemianopsia due to pressure on the chiasm is a very important sign although it does not always appear in a typical way in hypophyseal tumors. This was true in the case which I had Dr. Dabney see and which he mentioned in his paper. The patient had a large tumor of the hypophysis with typical changes in the visual field and in which the diagnosis was made largely through the large sella turcica revealed by the x-ray.

As to exophthalmos: When this occurs as a unilateral condition it may be due to retrobulbar growths or to intra-cranial growths which

have found their way into the orbit by breaking through the orbital bony walls. Such occurrence is quite infrequent.

In the case just spoken of exophthalmos was caused by pressure of the tumor on the cavernous sinus. This was shown at the operation. There was a large tumor of the hypophysis which had extended along the base of the brain.

I have seen one case of brain tumor presenting a typical ophthalmoscopic picture of Bright's disease. This was quite interesting to me because at the time I did not know that the stellate figure of white spots around the macula so common in Bright's disease could also occur in brain tumors. In the case mentioned there was an optic neuritis and a typical picture of Bright's retina though there was no choked disc. As the patient also had albuminuria and both hyaline and granular casts in the urine, I believed that the headache, nausea, etc., were due to the renal disease. As it developed later there was present a cerebellar cyst.

J. G. Sherrill: This topic is always interesting. Unfortunately we are not able to do as much for patients suffering from brain tumors as we would like and the mortality is high. Perhaps this is due in part to the fact that we do not see these patients early and the diagnosis is sometimes not made until very late in the course of the disease.

The points made by Dr. Dabney concerning the eye symptoms of brain tumor I think we should bear in mind because they are the early symptoms as a rule. Hemianopsia is usually an early symptom and impairment of vision also sometimes develops early. Headache, visual symptoms, vomiting, vertigo and nystagmus are the signs that we must always bear in mind in these cases, and I think this is a place where the internist, the general surgeon and the eye surgeon can all work together in harmony, sometimes with much good to the patient.

It seems to me rather easy to understand why choked disc occurs later in the course of the disease in some instances than in others. Choked disc frequently occurs as a result of general cranial pressure, and general cranial pressure is not the sort of pressure that gives rise to localizing symptoms. It may occur late where the growth of the tumor is gradual, where it is in some latent portion of the brain, or where there is little or no interference with the passage of fluid from the different ventricles. A tumor pressing on one of the ventricles or the passage between the ventricles will produce internal hydrocephalus which is likely to interfere considerably with the nerve and cause choked disc early. The reason choked disc occurs early in cerebellar tumors is because pressure is greater and interference with the circulation of the

cerebral fluid is quicker in developing than in some other regions.

The case mentioned by Dr. Dabney and also by Dr. Pfingst is one of extreme interest and I think rather unusual. A woman pregnant six months had been seen by a gentleman in a distant city who had pronounced the trouble tumor of the hypophysis. Roentgen-ray examination when I saw her showed apparently some enlargement of the sella turcica. The symptoms when we saw her pointed to a cerebellar tumor; she had optic neuritis not very marked in type, and some choking of the discs. At the time Dr. Pfingst saw her the choked disc was slight, but some days later it was perfectly evident that she had Bright's disease from the headache and the evidence of optic neuritis present. Dr. Dabney and also Dr. C. T. Wolf saw her some days later and they agreed that she had some choking of the discs in addition to the optic neuritis. The tumor proved to be a cerebellar cyst which ruptured ten days after a decompression operation and death occurred shortly thereafter. There was a small tumor dark red in color lying within this cyst. The cyst itself was about two inches in diameter and the tumor was about the size of a small marble. This small tumor was attached to the wall of the cyst as is usual in cases of this kind; the cyst was filled with light colored serous fluid and the tumor was free in this fluid except at its base. A peculiar feature is that had this tumor been properly located the cyst could have been emptied and the tumor removed—whether successfully or not I do not know, but I would be inclined in a similar case to open the brain and excise the tumor which could be done readily.

We made the operation for decompression not with the idea of removing the tumor, because we thought temporary decompression would give the patient some relief from pressure and perhaps save her eyesight while she was carrying the child, and we thought perhaps later we might be able to remove the tumor through the posterior route. Dr. Sidney J. Meyers was associated in the case and performed a caesarean section post mortem, but was not able to save the child. At necropsy it was found that the kidney was involved there being all the evidences of an existing nephritis. So we should always bear in mind in examination of the fundus in these cases that there is a possible resemblance of the symptoms in brain tumor and those of Bright's disease.

I want to say that the gentlemen who use the ophthalmoscope are always of the greatest help to the surgeon in the study of these cases, and we should seek consultation early with the ophthalmic surgeon and study the case carefully with him. If we are going to operate we should do so early before pressure and other changes

have destroyed the patient's vision.

I do not believe that we are ever justified in persisting in antisyphilitic treatment for more than a few weeks, because syphilitic tumors, if they are going to respond to treatment will do so promptly, and if there is no response to proper treatment we might as well proceed with the operation.

W. E. Gardner: In case of suspected brain tumor almost the first thing we do is to call for an examination of the fundus of the eye to determine whether there is any increase in the intra-cranial pressure, and if possible whether it is more marked on one side than the other. In addition to examining the fundus of the eye, investigation of the visual field referred to by Dr. Dabney, has often been of great help in diagnosis, especially when it is found that the optic nerve is involved. Ophthalmoscopic examination is certainly of primary importance in the diagnosis of brain tumors.

So far as the Barany tests are concerned—the turning test, caloric douching of the ears, etc.,—I have been interested in this subject for some time, and for the last year or two have used the Barany tests quite frequently. I think, however, in many cases the application of the turning test increases the pain and discomfort of the patient. Where the lesion is a brain abscess rather than brain tumor which not infrequently produces the same symptoms as brain tumor, the abscess may be ruptured during the Barany tests with a fatal outcome. It does not seem to me, therefore, that the turning test of Barany is an entirely safe procedure.

The caloric douching of the ear is a rather practical test, at least it has seemed to me that it helps in the localization of tumors about the cerebellum, it enables us to determine whether the tumor is in the superior or inferior peduncle. If the lesion is below the middle peduncle or pons in caloric douching of the ear you have the same responses as you have in the normal individual. In application of the caloric douching of the ear in normal patients we have nystagmus, past-pointing, vertigo and nausea. If the lesion is below the central peduncle of the cerebellum where the eighth nerve emerges we will have a normal reaction. If the lesion is in the central peduncle we will not have nausea, past-pointing nor vertigo, but we will still have nystagmus because the post-erior longitudinal bundle will not be involved. In the posterior longitudinal bundle, which is in close relation to the superior peduncle, we have the third, fourth and sixth nerves closely associated. Lesions in this situation would not show nystagmus, but we still have past-pointing, vertigo and nausea.

The caloric test is of help in localizing tumors about the brain stem unquestionably, but after all, so far as practical purposes are con-

cerned, it is not a question whether the tumor is in the superior or inferior peduncle, it is essentially in the posterior fossa, and when the surgeon comes to operate he is going to make a large decompression opening over the lower portion of the occipital bone to give plenty of room, even enlarging the foramen magnum if necessary so there will not be any impingement of bone on the medulla when intra-cranial pressure is released, and thus avoid respiratory paralysis. If we know the tumor is in the posterior fossa that is the main question.

If the Barany tests will assist in the determination that the tumor is in the posterior fossa then they are of great help to the surgeon. However, after all these tests are made, and after the neurologist has carefully examined the patient, it is sometimes difficult to say just where the tumor is located.

While in Chicago last summer I saw a case which will help to illustrate the points I have tried to make. The patient was supposed to have had a brain tumor and this diagnosis had been made clinically. Every known test was used in localizing the tumor. The neurologist said he believed the tumor was in the left cerebellum, but he was not sure it was not in the right frontal lobe. The surgeon agreed and opened the right frontal area as a preliminary operation, taking out a large piece of bone, but no tumor was found. Secondary operation disclosed the tumor in the left lobe of the cerebellum as indicated by the tests which had been made.

With all the refinements in diagnosis, however, it is sometimes very difficult to determine the exact location of brain tumors, and a preliminary decompression is usually justified not only to preserve the eyesight of the individual but also to lessen the increased intra-cranial pressure to the extent that it makes the secondary operation less hazardous and often much more successful than it would be otherwise.

I. A. Lederman: Dr. Dabney and Dr. Pfingst have left little to be said except to emphasize the observation that we must not look upon choked disc as being the only evidence of brain tumor. The word choked disc has been used rather too freely in the discussion. I can speak from observation in several cases. Dr. Dabney will recall having seen one of them. The man had a brain tumor and a decompression operation was done by a general surgeon a few days after we saw him. He had no choked disc at any time, but an engorgement of the vessels which was progressive, and doubtless if he had not died he would have developed choked disc sooner or later. He gave the history of intense headache for more than a year, but had no eye symptoms. No tests could be made, the man being bedridden when I saw him.

A case that has been of great interest to me was referred by Dr. John Edwin Hays, a woman seen nine or ten years ago, who presented double choked disc, headache of great severity, and other symptoms indicative of brain tumor. I advised immediate decompression, and a parietal trephine was made by the late Dr. Ap Morgan Vance. In the absence of any other symptoms we concluded the case was syphilitic. The woman was about twenty years of age. Under antisiphilitic medication she apparently made a perfect recovery. The optic nerve remained normal so far as I know and the woman was perfectly well until a few months ago when Dr. Hays asked me to see her again because she had a recurrence of the choked disc and other symptoms. I made the caloric test with negative results. She presented herself to another surgeon and a large central decompression was made. Again the optic nerve has returned to normal, she has gradually recovered from the choked disc, and her vision is now normal. Her vision field showed a definite contraction but no scotoma.

After she had recovered sufficiently from the decompression operation I tried on several occasions to use the turning tests of Barany, but they were absolutely impossible from the fact that the turning produced the most violent vertigo and the patient refused to submit to the examination. The caloric test was used again with normal findings.

I am glad the subject of the Barany tests has been discussed this evening. I feel very much as Dr. Watkins has expressed himself with reference to them. Since Jones has issued his book I have read it very carefully and have tried to get something out of it. I find as Dr. Watkins has said that the rotation tests are very confusing and I have been unable to decide as to their value. Dr. Friesner expressed himself to me as Dr. Watkins has quoted Cushing, i. e., that the subject had been approached with over-enthusiasm and that the findings of Jones have not been confirmed by anatomic, histologic or pathologic study. There is no question, however, that there is something in this subject, and after a while we will be able to approach it with a clearer understanding of its merits and demerits.

I want to emphasize everything Dr. Dabney has said in his paper. I think the ophthalmoscopic examination and determination of the visual field are very important diagnostic features in connection with brain tumors.

One of the patients mentioned by Dr. Dabney I had the pleasure of seeing before he went east to be operated upon by Dr. Cushing. The patient had double choked disc and bitemporal hemianopsia indicating that the lesion was far back. The picture is not always so typical.

John J. Moren: In regard to the diagnosis,

symptoms and localization of brain tumors: Neurologists look upon choked disc as a general symptom, a condition caused by increased intracranial pressure. So far as the localizing value of this symptom is concerned, it merely indicates that the lesion is below rather than above the tentorium. If choked disc occurs early in the disease the chances are in favor of the lesion being below the tentorium.

So far as third nerve signs are concerned, they are very reliable and may be relied upon as localizing signs. Sixth nerve signs are the most treacherous of the eye symptoms that we have so far as localization is concerned, on account of the tortuosity of the vessels involved, and the signs are of little value in localization.

As to the Barany tests: I know very little about them. I had the pleasure of watching Dr. Jones' assistant make these tests and he was very enthusiastic about their localizing value. He seemed very positive about the value of these tests. On the other hand the neurologists were very conservative and had little to say about the Barany tests. When I returned from Philadelphia I went to Camp Taylor where some work along this line was being done. Several cases of suspected brain lesions were studied but our results were not very encouraging.

I agree with what Dr. Sherrill has said, that the internist, the surgeon, the neurologist and the ophthalmic surgeon should work together in the diagnosis, localization and treatment of brain tumors.

John Edwin Hays: I wish to state that Dr. Lederman made a slight mistake in describing the focal symptoms in the case which was referred to him by me. The woman had for a long time loss of sensation in the left half of her tongue; she had almost complete aphasia; and during the last attack she had paralysis of the right side of her face. The most characteristic symptom in both the first and last attacks was intense, persistent headache which could not be relieved by any drug. I will state, however, that the patient at this time is apparently enjoying good health; she is able to attend to her ordinary household duties, and has very good vision.

I would like to ask Dr. Dabney if the choked disc which has been referred to, if persistent for a considerable length of time, does not tend to atrophy of the optic nerve. I would also like to have him tell us about the nature of the brain tumors to which he has made reference.

S. G. Dabney (closing): I appreciate the discussion very much. It seems to me that Dr. Pfingst used the word choked disc a little more perhaps than he intended. He spoke of the percentage of choked disc. I am inclined to believe that we should not limit our conception of

disturbances of the optic nerve to choked disc in connection with brain tumors.

I mentioned in the paper the fact that it was not very rare to find low-grade neuritis which went on to atrophy. I mentioned a young man of twenty seen a good many years ago. That case came to necropsy. He never had any choked disc, he had a mild optic neuritis which went on to atrophy, he retained the vision of the eye for a year or two, then gradually went blind in the other eye also. He developed convulsions and died in one. Necropsy showed a brain tumor. In that case there never was any choked disc.

A lady came to me many years ago with a slightly dilated pupil on one side which did not respond to light; she also complained of intense headache. I noticed when first examining her eye with the ophthalmoscope that she had a very suspicious looking mild optic neuritis. I thought it was syphilitic, and told her physician what I suspected it was. She went from one doctor to another. She was operated upon for hemorrhoids, she said her headache was greatly increased when she went to stool. One day, two or three years later, I was called to see her for an attack of "pink eye." I took the opportunity to examine her vision and the fundus oculi of each eye. The eye I had formerly examined was now blind from atrophy of the optic nerve, and there was a beginning optic neuritis in the other eye. I was now quite sure she had brain tumor. She retained the sight of the other eye for a year or more, the terrific headaches continued, and fortunately she died in a convulsion before the remaining eye went completely blind.

A word or two about tumors of the hypophysis; I think Benedict is correct in saying we are going to find more of them in the future than we have in the past, and that they are not so very rare. According to DeSchweintz it is a mistake to think we must have bitemporal hemianopsia; it is not always present. We must not be misled by failure to find bitemporal hemianopsia.

I believe it is always quite as important to measure the field of vision as to examine the fundus. In hypophysis cases it is more important, because there is no pallor of the nerve for an average of four months after contraction of the visual field has occurred, so that would be far more important than absence of optic neuritis.

Dr. L. W. Frank made a very important point in speaking of disturbance of the color field. I am glad he called attention to that feature in examination of the ocular apparatus.

Dr. Moren has voiced the general opinion in saying that paralysis of the abducens has no localizing value. Involvement of the abducens

may be due to indirect pressure of the tumor in the brain.

Dr. Sherrill's case is very interesting. I had the advantage of seeing the patient after she had been seen by Dr. Pfingst. There then was decided choked disc. I expressed the opinion that there was a tumor present, and that happened to be correct.

Dr. Sherrill says he thinks it a mistake to continue antisyphilitic treatment over an extended period. I am sure this is correct. Nearly everyone seems to think that gumma of the brain can be dissolved, but experience has shown this cannot always be done. The patient cannot always be cured by antisyphilitic treatment. Decompression is frequently the procedure that is necessary to retain the sight if nothing else before the patient becomes blind in both eyes.

MISLEADING SYMPTOMS IN SYNOVITIS AND BURSITIS. *

By B. A. WASBURN, Paducah.

It is impossible to cover minute details in regard to histories and I only mention cases that have come under my care where I found conditions at the time of examination, much different than were expected by the patient.

It is wise to keep in mind the possible complications that may follow the predominating symptoms of synovitis and bursitis.

Taking into consideration the active condition that must exist, we should keep the following complications before us. Cases of specific origin, Trauma, Rheumatism, Tuberculosis and Malignancy. When bursitis and synovitis are present we should continue the examination until the diagnosis points directly to one of the above as a causative factor, or the case shows a local origin.

It frequently happens that we have trauma with marked swelling about the joint. Soft tissues torn and small portions of bone removed. Blood extravasated into the cellular tissue around the joint. An examination should be made to ascertain the extent of injury to nerve and blood supply as well as bone involved.

Synovitis and bursitis are secondary complications usually following an injury unless constitutional. When tenderness and swelling are present with no history of trauma, much importance should be attached to this condition, because tendons protect as well

*Read before the Kentucky State Medical Association, Lexington, September 27, 28, 29, 30, 1920.

as to help function and may hide an active inflammation.

I have seen patients that were treated for rheumatism that had a synovitis or bursitis which was caused by an injury and the length of time that these cases were allowed to continue a long treatment, terminating the case into an osteomyelitis or periostitis. I am of the opinion that more importance should be attached to cases that give no history of trauma, because prognosis is a question of doubt in some cases.

In giving you the history of these cases, I do so with the view of mentioning the supposed diagnosis and the positive diagnosis. It is an evident fact that these cases did have underlying complications that were covered up by synovitis and bursitis.

I know many patients cannot stand manipulation of joints when they have reached the septic condition that pus absorption pro-

mask the leading symptoms of cases that require radical treatment.

CASE 1.—Patient up on crutches, leg in splint. Statement of attending physician, that the patient had a fracture of the patella. Examination—bursitis of the pre-patella bursa.

This man had planned a damage suit. He was much surprised when the X-Ray showed no fracture.

CASE 2.—Boy 16 years, Synovitis, right elbow joint. Case diagnosed as rheumatism. Eleven days from accident chills developed. X-Ray examination showed osteomyelitis of humerus. Shaft of bone was opened and drained, case cleared up.

CASE 3.—Girl 15 years. Treated for rheumatism because she had a synovitis at elbow joint, (right side) with much swelling along entire arm and slight degree wrist drop. X-Ray showed an osteomyelitis of humerus.

CASE 4.—A young man, thirty years, fell off a ladder striking heel on the edge of a stone bench. He was carried home and local applications applied. There was much tenderness reflected in the foot and as high as the lower third of the leg. In an effort to assist the condition of trauma, he made frequent efforts at extension and flexion, making the condition worse. At the time I saw him he had a Teno-synovitis. I suspicioned bone involvement at the insertion of the tendo-achillis, because there was not the rigidity of tissue in keeping with the injury on extension and flexion. X-Ray findings—fractures of Calcaneus.

CASE 5.—A man, thirty-seven years old, was treated for rheumatism and tuberculosis of right knee joint. Examination—bursitis, sacs filled with fluid producing great deformity as regards shape of knee. X-Ray findings—Myo-osteosarcoma. (Photo-Exhibit.)

CASE 6.—A girl sixteen years old injured wrist, due to a fall while skating. Patient was waiting for swelling to leave the joint with the idea that she would then be well. Examination—synovitis of wrist tendons. Manipulation impossible due to injury and pain. X-Ray findings—fracture of ulna.

CASE 7.—Male, fifty-seven years. Small ulcer leg. Bursitis right knee, cough, chill emaciated—"Tuberculosis of knee." X-Ray—Myo-osteosarcoma. Leg amputated.

CASE 8.—Male, fifty years. Bursitis, right knee. Diagnoses, fractured patella. X-Ray findings, no fracture.

CASE 9.—Male, forty-two, traveling man. Diagnosis, fracture. On third day I made ex-



duces and there is always a possibility of additional injury with intense manipulation in an effort to make a diagnosis. So it becomes necessary to rely upon your X-Ray in cases where a question may arise involving some one of the complications herein mentioned.

The following cases will give you an idea of how it is possible for this condition to

amination, removing splints, found a synovitis, wrist joint. No fracture.

CASE 10.—Boy eleven years. Knocked down and run over by a wagon, some laceration of tissue. Synovitis, elbow joint, marked swelling of arm. Rest was advised, but no splint applied. Fourteen days later X-Ray showed osteomyelitis.

CASE 11.—Male thirty-seven, pneumonia, pleural cavity tapped, lymphatic glands enlarged abscess of cervical glands, bursitis of right knee. Diagnosis—osteomyelitis of tibia caused by trauma. True findings in this case—tuberculosis. This case was tried out in the courts and sufficient evidence presented to show that trauma was not the causative factor in this case.

CASE 12.—Boy twelve years. Synovitis at elbow joint. Treated for rheumatism.



X-Ray findings, osteomyelitis affecting the lower third of humerus and olecranon process. Operation on shaft of humerus and removal of upper third ulna.

I have not given minute details in the history of these cases because it takes up too much time, I merely give the main points of interest to show how it is possible for the tendon sheaths and bursa, when injured, to

mask important conditions, a hasty diagnosis frequently causes much criticism and embarrassment.

Always immobilize injuries by whatever method may suit the case, (using passive motion at intervals.) Where synovitis is pronounced and persistent be sure to X-Ray. It is a good habit to form, "X-Ray all your cases." Sometimes it is hard to see why errors are made because we do not know the difficulties under which the doctor may be compelled to work, but if it is within his power to give the patient the benefit of the X-Ray, it should be done in every case. Frequently, I see so called fractures at the wrist, where the true condition is a synovitis. So it is absolutely important to rely upon the X-Ray for accurate findings. I do not refer to simple cases, only where these special symptoms are pronounced and persistent.

It is important to keep in mind that Synovitis and Bursitis are two conditions of great importance in Orthopaedic work. They not only stand as a pathological state, but may hide serious complications.

You cannot look upon synovitis and bursitis as you do trauma to muscle tissue, by so doing, you may overlook very important conditions that are produced in the individual injury.

The following will give you some idea as to the trouble you may have with Bursa inflammations.

1. Acute septic Bursitis following a penetrating wound of the Bursa.

2. Trauma caused by different occupations where there is a continuous pressure over the Bursa.

3. Gouty bursitis, leaving deposits in the sacs caused by Urate of Soda. You will sometimes find appearance of chalk deposits.

4. Bursitis caused by specific diseases.

5. Sub-patella bursitis. This Bursa lies between the patella ligament and the head of the Tibia and will produce swelling on each side of the patella ligament, preventing the patient from stair climbing and extension of limb.

6. Achilles bursitis, this bursa lies between the tendo-achillis and the os-calcis. This Bursa is frequently the site of tubercular and the Syphilitic inflammation, producing a swelling on each side of the tendon.

7. When you have an inflammation of the ilio-psoas bursa, where it communicates with hip joint, you may look for tuberculosis or osteo-arthritis.

8. Olecranon bursa lies between the skin and the olecranon process, and in cases of severe trauma it may hide an olecranon frac-

ture. These are cases where it is essential to be positive in the diagnosis, otherwise you may look for severe bone complications.

DISCUSSION

P. C. Layne, Ashland: In discussing this excellent paper I desire to mention a case which I recently had under treatment and from which I learned a very important lesson.

A boy was brought to me a short time ago with an injury to the knee joint sustained by falling upon a jagged piece of glass the previous week. The joint was enormously swollen, very painful, and tense; there was a foul lacerated wound about one-half inch long over the inner side of the joint; the temperature was 104 and the pulse rapid, and there was every indication of beginning profound sepsis.

The doctor who brought the boy had made a diagnosis of joint infection, and wanted the joint opened and drained at once.

Before consenting to do this I inserted an aspirating needle into the joint cavity from the outer side and drew off about 20 cc. of cloudy serum, almost purulent. The next morning under an ether anesthesia, I made an incision down through the wound to the joint capsule and discovered a large pocket of pus which was entirely extracapsular. The finding of pus in this locality and of serum from the joint interior caused me to desist from opening the joint capsule and draining it. This was the lesson that I learned. That there may be strong indications of joint involvement, when the chief trouble lies outside the joint cavity.

Had I made a bold incision into the joint cavity I most likely would have had disastrous consequences follow it; as it was, the joint was spared the extra infection and trauma and returned more speedily to the normal. I injected the joint proper with 20 cc. of Murphy's 2% solution; cleaned out the wound, instituted continuous irrigation with Dakin's solution, applied an extension apparatus, and at the end of a week's time the joint had practically returned to normal.

B. A. Washburn (closing the discussion): Referring to the discussion, I consider this a very important subject.

Remember this: do not make a diagnosis of a joint injury until you eliminate all possible complications.

Dr. Layne's remarks regarding the use of the x-ray brings out the necessity of using the fluoroscope with all cases of synovitis. Why? With complications you cannot be sure that there is not a break in the bone tissue, (in severe injury cases), unless your examination is made with an x-ray.

This method of examination gives the patient

the best service, prevents mistakes, and gives you a positive basis upon which to make a diagnosis.

THE END-RESULTS OF SURGERY OF THE KIDNEY.*

By JNO. R. WATREN, Louisville.

The success of any surgical procedure must be judged by its end-results, and we are no longer content to know that an operation has a low mortality rate, but we must know that it has benefitted or cured the patient's disease.

We are forced to base our judgment on our own personal experience, combined with an analysis of the work of our largest clinics.

There is hardly a field in surgery that has made greater progress in the last twenty years than that of the operative treatment of diseases of the kidneys.

During this period the writer's own experience has embraced 64 operations upon the kidneys and the ureters for the following conditions: pyonephrosis combined with stones, 11 cases; stones in the kidney or ureter, 18 cases; ruptured kidney from trauma, 2 cases; gun-shot wounds of the kidney, 1 case; malignant tumors of the kidney, 4 cases; movable or floating kidneys, 19 cases; polycystic kidneys, 2 cases, and tubercular kidneys, 8 cases.

With the development of the methods of determining the functional activities of the kidneys, and the improvements in the x-ray, and the cystoscopic technique, we have introduced a greater factor of safety; also with a better understanding of the pathology, improved methods of operating and handling the tissues, comes a lowered both immediate and late mortality rate.

TUBERCULOSIS OF THE KIDNEY:—Statistics on renal tuberculosis by Kelly (1) of Johns Hopkins Hospital record 100 nephrectomies with a mortality of 4 per cent, and a secondary death rate of 10.9 per cent. Lower and Crile (2) of Cleveland report 87 nephrectomies for renal tuberculosis with a death rate of 2.3 per cent. Braasch (3) of the Mayo Clinic reports 516 nephrectomies for tuberculosis with a primary mortality of 1.3 per cent, a negligible factor. The late mortality (5 years or less after operation) is approximately 20 per cent; failure to effect a complete cure is approximately 20 per cent; this leaves a prognosis of recovery in 80 per

*Read before the Kentucky State Medical Association. Lexington, September 27-30, 1920.

cent, and a complete cure to be expected in fully 60 per cent of cases.

Eisendrath (4) of Chicago, says: "Of late deaths, i. e., after six months, about 45 per cent are due to pulmonary tuberculosis; 35.9 per cent to tuberculosis of the opposite kidney, and 14 per cent to miliary tuberculosis. It is of interest to note that tuberculous meningitis is a frequent cause of death in the late cases. The bladder symptoms the slowest in disappearing, and it requires from six months to two years for these to subside."

Lower (2) says: "The length of time during which bladder symptoms persist after operation is directly proportional to the duration of the same symptoms before operation."

It is interesting to note that Braasch (3) found coincident active pulmonary tuberculosis in 5 per cent of his patients, of whom more than 60 per cent recovered following nephrectomy.

The post-operative mortality in the male is higher than in the female. In bilateral tuberculosis of the kidneys, nephrectomy is seldom indicated, as in 62 cases reported by Israel, 42 died within a few months after operation.

Braasch (3) has observed that recovery or permanent improvement of the remaining kidney will not follow after one kidney has been removed in cases of bilateral renal tuberculosis.

In the writer's eight cases of nephrectomy for tuberculosis of the kidney, one patient died from shock soon after the operation, due in all probability to slow hemorrhage from damaged veins, while the remaining seven cases made primary recoveries; three of these were of long standing before operation, and the bladder symptoms were still persisting when they developed a more or less rapid type of pulmonary tuberculosis, and died within one or two years after nephrectomy. The other four cases are all living when last heard from, and three of them are of over five years' standing. My eight cases were all in women except one, a fact at variance with Braasch's statistics which show that tuberculosis of the kidney occurs in the male twice as often as in the female, but this I account for as the largest part of my surgery being gynecological.

If the statistics of renal tuberculosis teach us anything it is that what is most needed is an early diagnosis and a prompt nephrectomy before the lesion has progressed too far and complications or foci of infection develop elsewhere in the body.

NEPHROLITHIASIS:—If the statistics of the Mayo Clinic on operations for stone in the kidney were taken as the mortality

rate for the average surgeon, one would say that operations upon the kidney and ureter for stones were almost free from danger; but such is not the case. In a recent paper, C. H. Mayo (5) reports 937 patients operated upon in the last 20 years for stones with eleven deaths, (1.12 per cent mortality).

In considering post-operative results, it is interesting to note that Cabot (6) of Boston, states that his statistics show that 49 per cent had a recurrence of stone in the kidney after operation, while Braasch claims slightly under 10 per cent of recurrences. In his cases, 13 patients in whom a recurrence was found, 11 were reoperated on and in every case but one, the stones recurred in the same portion of the kidney as at the primary operation.

Nearly half of the cases reported by Braasch were nephrectomies and were diagnosed clinically as pyonephrosis with stones.

This emphasized a very important point, namely, that if we would make more routine x-ray examinations of the kidneys of all of our patients coming to us for surgical conditions we would discover stones early before the kidney had been damaged to such an extent as to require its complete removal.

Braasch says that: "It may be safely stated, that with accurate preoperative diagnosis, good operative technique, and judgment, the percentage of recurrence of renal lithiasis should be less than 10 per cent."

Judd (5) has recently written, "While the operation for the removal of calculi from the ureter must be considered a major operation, it may be performed with practically no mortality and with universally good results."

In the writer's own cases, eleven were nephrectomies for pyonephrosis combined with stones, and due to the weakened condition of the patients and the other damaged kidney four deaths occurred soon after the operations either from shock or uremia.

In the eighteen cases for stone in the kidneys and ureters, six operations were for stones in the ureter low down and all recovered; and of the twelve operations for stones in the kidney two died, one from internal hemorrhage through the ureter and bladder due to faulty closure of the nephrotomy incision and the other from anuria. Those cases which made operative recoveries have remained well, as far as I am aware and only two returned with pain in the other kidney, which was x-rayed with negative finding. My youngest patient operated upon for nephrolithiasis was a boy 8 years old and my oldest patient was a woman of 67 years.

MALIGNANT TUMORS:—The relative frequency of the different types of malignant growths of the kidney is difficult to determine owing to the lack of uniformity in the classification; but it is generally considered that hypernephroma constitute about 50 per cent.

Braasch (8) of the Mayo Clinic, in a study of 62 cases of malignant tumors operated found the mortality of the cases dying at the hospital to be 11 per cent. There were also 22 explorations in which the tumor was found to be inoperable.

Garceau (9) collected 143 cases of nephrectomy for hypernephroma with an operative mortality of 30 per cent, while Albarren and Imbert's (10) statistics show 20 per cent. Squier (11) of New York, collected 24 cases operated in St. Luke's Hospital in 12 years with an operative mortality of 50 per cent.

Isreal (12) reported 22 cases of hypernephroma in 14 of which death occurred after three years, while Braasch reported 27 per cent of three year cures and 10 per cent of five year cures in which nephrectomy was performed.

The writer's cases consist of four tumors of the kidney diagnosed at operation as malignant and inoperable.

Judging then from these figures we would conclude that the primary operative mortality will run anywhere from 11 to 50 per cent, and the same figures would about represent the percentage of five year cures.

NEPHROPTOSIS OR MOVABLE KIDNEY is a pathological condition which a few years ago attracted much attention and many cases were operated upon which today would be let alone or treated by other means.

Squier (13) says that "It is manifestly a waste of effort to operate for the kidney condition and expect a permanent cure when it is merely a single manifestation of a general process, such as a viseroptosis, or neurasthenia. Efforts directed towards correcting the general condition should be made. Exceptions to this are, of course, those cases with severe acute symptoms, such as 'Crises,' or where a dilation of the pelvic threatens to injure the kidned severely."

Most authorities report a low operative mortality rate and a fairly large percentage of cures.

Personally, the writer in his earlier work performed this operation quite frequently, 19 cases without death, but must confess that he rarely sees an indication for the operation at the present time; nevertheless, we do not wish to go on record as condemning the sur-

gical procedure as there are still undoubtedly cases where it is indicated.

(1) Kelly and Burnam: Dis. Kidneys, Ureters and Bladder 1914.

(2) Lower and Shupe: Surg. Gyn. and Obs. Nov. 1920.

(3) Braasch: Amer. Journ. Med. Sciences Jan. 1920.

(4) Eisendrath: Surg. Clinics of Chicago April 1920.

(5) Mayo: Annals of Surgery Feb. 1920.

(6) Cabot: Modern Ureology 1918.

(7) Braasch: Surg. Gyn. and Obs. Jan. 1917.

(8) Braasch: Jour. Amer. Med. Assn. 1913 LX 274.

(9) Garceau: Renal, Uretal, Poutrenal and Adrenal Tumors 1919.

(10) Albarren and Imbert: Tumeurs du Rein 1903.

(11) Squier: Boston Med. and Surg. Jour. 1909 CLXL 547.

(12) Israel: Chir. Klein. d Neurenkrankheiten 1901.

(13) Squier: Modern Urology, Cabot, 1918.

DISCUSSION

Roscoe S. Plumlee, Smiths Grove: I wish to mention one point, and that is the diagnosis of these concretions in the kidney and gall bladder. I heard Dr. Smithies, of Chicago, read a paper on the use of the x-ray in the diagnosis of these concretions that form in the intestines, the gall bladder and the kidney. I wish to emphasize what is not revealed by the x-ray. I have a friend who was subjected to an operation for chronic appendicitis. Before operation the use of the x-ray was resorted to. Two skiagrams were made. There were other pathological conditions in addition to the chronic appendicitis that ought to have been brought out by the use of the x-ray, and that was a gall-bladder full of gall-stones, which was not suspected, and two skiagrams revealed nothing. I wish to mention this one thing by way of faulty diagnosis with the x-ray.

D. Y. Keith, Louisville: I should like to speak of the value of the x-ray when properly used. We all know the value it has in detecting a large or small stone in the kidney, and with the use of the x-ray you are able to make a diagnosis. Pyelograms and cystograms of the bladder and the x-ray should go hand in hand as aids in making the diagnosis.

Dr. Wathen spoke of the recurrence of stones following the removal of stones. At present at the Mayo Clinic they use at the operating table the fluoroscope. Their idea is two-fold. In some cases they do not use it, but in my opinion it would be of service to use it at every operative

case. You may have one stone the size of a good large prune. You do not need the use of the fluoroscope on that. You can find it, but you do not know whether you have left a fragment or not. You may have left a fragment behind. This accounts for some of the recurring stones. A fragment is left and forms another stone. The technique is this: When the kidney is delivered out of the operative field, and remove a large stone they have a bed-side unit on the opposite side of the table from the roentgenologist; the kidney is pulled up with the ureter in the center, and a piece of gauze is put on each side of the kidney and the kidney is pulled out of the field. The kidney is pulled up, with the x-ray tube (indicating) and the fluoroscope opposite to each other. With the fluoroscope they look and see if any fragments are left. If the x-ray reveals a shadow or one or two shadows the operator goes in and sees if he can find anything. With this method they are able to report a smaller percentage of recurrence of stones than in the past. The percentage of recurrence of stones will decrease if this technique is used by all operators.

J. R. Wathen (closing the discussion): In connection with what Dr. Keith has said, I wish to say that the percentage of recurrence of stones is less than 10. That is a good percentage in work of this kind.

A peculiar thing brought out by Braasch is that when a stone recurs, it recurs in the same place where the stones were removed before. We may have removed the stone or stones, but we have left a fragment behind. It is very much like removing stones from the gall-bladder. If you leave the gall-bladder it will reform stones, and the same is true if you leave the kidney. I doubt whether this new idea advanced by the Mayos is important. We cannot prevent overlooking a stone, and as long as we leave an area of the kidney which formed the first stone, how can you prevent the recurrence of stone?

The majority of these cases come to us so late that we do not leave the kidney. We take it out. Over half of the cases require nephrectomy. The whole kidney has to be removed, and in that percentage of cases when the kidney has to be removed we will not have a recurrence of stones.

There are many important points in connection with kidney surgery, but one of the most important in my opinion is this: We should make a careful examination of every patient that comes to us for surgery, and I am making more examinations of the kidneys and ureters and bladder for stones in certain conditions where we suspect appendicitis or gastrointestinal trouble than I formerly did. If routine examinations are made, we will make more accurate diagnoses of our cases, and we will find

a great many surprises. We will find stones in kidneys where we did not expect them—quiescent stones not giving symptoms at all. At the same time, in kidney work we should not only make a routine kidney examination with the x-ray and of the gastrointestinal tract, but the day is coming when every patient who presents for surgical diagnosis will have a further examination, like a routine Wassermann, or a routine blood examination, as well as x-ray examination. In this way we will stumble on the thing we least suspect. Conditions of the kidney are hard to diagnose by the older methods, and as our methods improve we will not overlook conditions we formerly did, but we will be of great benefit to our patients and do more careful and accurate work.

TERTIARY SYPHILIS: REPORT OF THREE CASES.*

By J. GARLAND SHERRILL, Louisville.

I desire to report briefly, with comments, three cases of tertiary syphilis which came under my observation a number of years ago.

The first was gumma that appeared on the penis near the root in a man forty-five years of age. My first suspicion was that this was a primary lesion, but further investigation proved that it was not a primary lesion but a gumma on the dorsum of the penis. The case responded promptly to the old-fashioned treatment.

The second case was in the person of a member of the diplomatic service who gave the history of syphilis twenty-five years before. For many years he had a discharging sinus on his thigh with a large amount of induration over the rectus femoris muscle and fascia of the thigh. He had been operated upon once or twice and apparently syphilis was unsuspected. The patient was given mercurial treatment with prompt response and he eventually became entirely well.

The third case was a woman about thirty-six years of age who had for a number of years discharging sores on one foot and leg. The condition had persisted for such a great length of time that there was marked increase in size of the foot. I reported this case once before. The enlargement of the foot continued to the point where it resembled elephantiasis, and the affected leg was three times larger than the other one. The toes were sore and pus escaped from the cellular planes. This was also a case of gumma in the cellular spaces and skin. The case was in-

*Clinical Report before the Louisville Medico-Chirurgical Society

tractable and did not get well under treatment. The patient finally became tired of carrying around this very large foot that amputation was performed. At last accounts, several years afterwards, she was living in comparative comfort.

I wished to mention these three cases because an important question is raised in connection with syphilis. Gummatous formations had occurred particularly in the cellular planes under the skin, and in two of the cases also involved the skin. We should always be on the alert and suspect syphilis in cases of this character. They respond usually very readily to mercurial treatment and of course will doubtless respond more promptly to the administration of arsphenamin. I believe, however, that we did not, in our enthusiasm about the use of arsphenamin, depend upon it entirely in the treatment of syphilis. I do not believe any case of syphilis should be treated solely by arsphenamin, nor by the use of mercury, nor by the use of potassium iodide. A combination properly applied of these three methods of treatment will give the best results in these cases.

The remark I am now going to make may not be in line with the facts, and I have nothing in mind to support my contention except my personal observation. I have seen any number of cases where patients were afflicted with neurosyphilis where arsphenamin had been given repeatedly and frequently—rather too frequently, I think—and have seen these patients rapidly develop paresis and succumb within a short time. I believe we should be very cautious about the repeated use of arsphenamin in certain types of cases that we are likely to see.

I merely offer this as a suggestion, hoping you will observe it and see what your experience is. It seems to me that many patients have rapidly deteriorated under treatment with arsphenamin repeatedly and frequently administered; nerve symptoms have developed with marked degeneration, paresis and finally a fatal termination. I do not mean to say, however, that some of these patients might not have developed paresis in the absence of arsphenamin treatment, but under the mercurial treatment of older days such patients have been relieved and remained in a state of comparative comfort for a long time. Where arsphenamin is given frequently over a short period of time, serious symptoms sometimes occur.

DISCUSSION

W. J. Young: I think Dr. Sherrill made a good point in regard to cases of gumma. It is a fact which should be borne in mind that syphilis

should always be excluded, and in trying to exclude syphilis we are often impressed with the fact that it coexists with other diseases and we do not have to exclude it because it is present and we do not suspect it.

With reference to what Dr. Sherrill has said about arsphenamin producing neurosyphilis: For the last year or two the idea has been prevalent that arsphenamin has a tendency to produce neurosyphilis; in other words, we have had more cases of neurosyphilis during the last two or three years than we have ever seen before. I think it is the consensus of opinion, and this agrees with my own observations, that this is not always the fault of arsphenamin itself, but rather it is due to the false sense of security which arsphenamin gives to the patient. For instance, during the primary and secondary stage of syphilis the patient is given a few weekly injections of arsphenamin intravenously and all his symptoms disappear and he probably feels better than he has for many months. Right there he is apt to neglect treatment and the only thing arsphenamin has done in that case is to cause subsidence of some of the symptoms of syphilis.

Dr. Sherrill is right in what he said in regard to mercury and potassium iodide. I think it is a fallacy to attempt to treat syphilis with arsphenamin alone. My opinion is that mercury is still king and that arsphenamin merely helps mercury in its action. It is the combination of arsphenamin, mercury and potassium iodide from which we may expect to secure the best results.

I do not believe arsphenamin has the effect of producing neurosyphilis. When arsphenamin first came into use it was thought to cause blindness from progressive optic nerve atrophy. It is true that people suddenly became blind while being treated with arsphenamin for syphilis, but the most probable explanation of this is that they already had progressive optic nerve atrophy, the optic nerve was already irreparably damaged, and the arsphenamin failed to arrest the progress but had nothing whatever to do with the production of blindness. In substantiation of this I may say that today we depend upon arsphenamin almost entirely to combat the ocular symptoms of syphilis, but use mercury to influence the constitutional part of the disease.

S. G. Dabney: Ophthalmists see a large number of patients with late syphilis; they come to us for double sight and for atrophy of the optic nerve. I am very fond of sitting down with these patients and having long talks with them. I do not believe I am wrong when I say that I have never seen a patient with ocular syphilis who had been treated vigorously for three years by the old-fashioned methods. That has been my personal observation. I have seen

case after case where the patient had been treated not at all or had been treated for six months and had been given $\frac{1}{4}$ grain of the protiodide of mercury for a year perhaps after that. But in talking with these patients during my experience of many years, I have never yet had one of them say to me: "Doctor, I was treated by mercurial injections or mercury internally, vigorously, intermittently and persistently for three years." (The Fournier method.)

It may be true, as has been suggested, that there are two types of spirochaetes which cause the various manifestations of syphilis, but according to my reading this remains unproven. I believe the old-fashioned treatment is the most efficacious in any form of syphilis. I have never seen a case of optic nerve atrophy, Argyll-Robertson pupils, diplopia or other ocular lesion in syphilitic patients who had been vigorously and intensively treated for three years by the older methods.

John E. Hays: As we all know the two remedies arsenic and iodine are very valuable in the treatment of syphilis, and probably in most cases we may employ them to advantage.

I wish to say that three years ago when the American Medical Association met in Chicago, I heard from the floor in the Dermatological Section a man whom I think is a leader in dermatology and syphilis in this country make this statement: that if he had the disease himself and had to confine himself to one remedy that remedy would be mercury and it would be used by inunction.

While in Munich two years ago, in a large syphilitic clinic, I saw no other method used except inunction. I asked the chief of the clinic why he used mercury by inunction to the exclusion of the newer methods in the treatment of syphilis, and he replied that they saw no reason for adopting the newer methods, the mercurial inunctions produced results and that was all they were looking for.

W. E. Gardner: I am very much interested in Dr. Sherrill's remarks along the line of the treatment of neurosyphilis. I think there is no question but in the last few years the pendulum has swung away from arsphenamin in the treatment of so-called parasyphilitic conditions. I believe in the ordinary types of cerebrospinal syphilis, where gummatous formation is producing headache and involvement of the cranial nerves and before there has been any degenerative change, the intravenous administration of arsphenamin does no good. After the condition has reached the stage known as parasyphilis, tabes and paresis, I doubt if we accomplish very much by the use of arsphenamin.

I think the pendulum is swinging back to the use of mercury by inunction. I do give intramuscular injections of mercury, however, in

many of these cases. I thought a few years ago when the Swift-Ellis method was introduced for the treatment of syphilis of the nervous system, certainly it looked like the logical thing to do. I was quite enthusiastic about it for a while, but having seen a number of cases treated by this method during the last few years, I am opposed to the use of it. I have seen many cases of paresis progress to rapid degeneration with sudden dissolution under this method of treatment. These patients were apparently progressing favorably prior to the use of the Swift-Ellis treatment.

Furthermore, we have known for a number of years that a certain number of cases of paresis will have remissions and improve without any sort of antisyphilitic treatment. Years ago before it was known that paresis was due to syphilis, when it was thought to be the result of overwork, severe mental strain, excessive use of alcohol, etc., and before the days of the Wassermann, the diagnosis of paresis was made. A great many of these patients under general tonics, rest and hygienic measures had remissions and apparently became well. So it is difficult to tell how many cases are really benefitted by antisyphilitic treatment. Many syphilologists claim a small percentage of cures of paresis under arsphenamin treatment, but as a considerable number of patients improve without antisyphilitic treatment, we are in doubt as to how much good has really been done.

I was greatly impressed a few years ago by a paper read before the Jefferson County Medical Society by Dr. Pusey, of Chicago. He claimed salvarsan was of great value in acute syphilis, particularly in secondary and possibly tertiary lesions, but advised strongly against its use in parasyphilitic affections. He believed that after a number of years the body acquired a certain amount of resistance to the disease, and by the use of salvarsan, which created a very strong reaction in the body, this resistance was lowered and the patient often went from bad to worse. However, where the diagnosis of parasyphilis is once made the outlook is so unfavorable that the use of arsphenamin may be permissible even if it does shorten the life of the individual; in fact, this may be the best thing to do because the condition is hopeless. Perhaps after all, when it can be demonstrated that the patient has syphilis at any stage, it is right and logical that he shall have the benefit of antisyphilitic treatment, but the ultimate result, based upon our present knowledge, is very uncertain especially so far as the parasyphilitic conditions are concerned.

John J. Moren: It is sometimes a difficult question to determine what the results will be from specific treatment, either the arsenical compounds, mercury, the iodides, etc., in any

case of syphilis. Several years ago in the Hospital College of Medicine I had under observation a man with cerebral syphilis which had not progressed to the parietic stage. We began to push antisyphilitic medication but no good was accomplished. Upon investigation we found that this man was suffering from lack of sufficient food. We gave him food and iron and in the course of a few weeks he improved greatly in his physical condition, then we began giving him mercury and potassium iodide followed by further improvement. He finally became perfectly well so far as any clinical signs were concerned.

Since then it has been my policy, when a patient with syphilis comes under my care, if the nutrition is good I give him large doses of mercury and the iodides; if his nutrition is below par, I do everything possible to improve his physical condition, give him tonic treatment and try to increase his resistance, and then institute antisyphilitic treatment. In this way I believe it is possible to maintain nutrition and prevent degenerative changes. In other words, I think it is better to hold the man's nutrition where it is rather than take the chances of lowering his already weakened vitality by giving large doses of any of the antisyphilitic remedies.

If I had syphilis or knew that I had it, there is one thing I would insist upon invariably, and that is inunctions of mercury. I believe in rubbing. Of all the men I know who use mercury liberally in the treatment of syphilis, particularly by inunction, I have never known of any nerve syphilis to develop from their work. One doctor at Hot Springs (Dr. G.) has secured the best results from mercury of any man I know. I have seen a number of patients he has treated and not one of them developed nerve syphilis. On the other hand I am aware of one doctor in Louisville who did not use much mercury; he merely gave a short course of the drug by mouth and then administered iodide of potassium. I have seen at least six patients with locomotor ataxia following his treatment. I recall an old doctor who used to be in eastern Kentucky, who had quite a reputation for treating syphilis. I have known quite a number of patients he treated, and not one of them ever had nerve syphilis. He gave mercury and continued the treatment for three years. He gave a great deal of mercury by inunction.

One thing about the prevalence of nerve syphilis today: I do not see nerve syphilis in patients who have been properly treated. You take those men who visit the various clinics and receive one or two doses of arsphenamin, which causes disappearance of the symptoms; these are the ones who are prone to develop nerve syphilis, not those who are treated for a sufficient length of time. However, there is one im-

portant point which has already been mentioned, that some patients will develop nerve syphilis regardless of the character or the amount of treatment instituted. Gowers did not believe in maximum doses of iodide of potassium, he said that ten grains three times a day should be the maximum dose, and he referred particularly to nerve syphilis.

W. J. Young: So far as the treatment of paresis is concerned: I think it is the consensus of opinion that there is no universally satisfactory treatment. In *tabes dorsalis* I think we can at least secure temporary favorable results by the administration of arsphenamin and mercury. I recall three tabetic patients who have been able to work for over two years. When they applied to me for treatment they were utterly incapacitated for any kind of work. Of course so far as any regeneration of nerve tissue is concerned, there is no way by which this can possibly be accomplished; but in these three cases the progress of the disease has been arrested and there has been marked clinical improvement.

As to the use of mercury by inunction: I belong to a later generation and probably do not know how to rub mercury; but I have gotten better results with the soluble forms of mercury than the insoluble forms by intra-muscular injections.

In so far as the general treatment of syphilis is concerned: I think we are apt to see the whole scheme revolutionized at any time. While we are able to secure favorable clinical results, that is disappearance of symptoms, by present methods of treatment, we know little about the end results. We have no positive evidence of permanent cure except scattered cases of apparent reinfection. I would not be surprised to see a complete change in the treatment of syphilis within the next few years.

J. R. Morrison: I think Dr. Moren mentioned a very valuable point in the treatment of syphilis, that is we must understand the patient individually and keep him at the highest level as to physical condition to secure the best results from antisyphilitic treatment.

Not long ago I visited the clinic of an eminent syphilographer and in talking on this subject he told me that he believed in treating syphilis with the idea of raising the resistance of the individual and that he did not believe in over-treating the patient. He was of the opinion that inunction of mercury was the best method in which to employ it. He used mercury in small quantities by inunction and also advised the administration of iron and other tonic medication, with the idea of increasing vital resistance. I believe this is an important point.

In treating neurosyphilis it is important to

classify the cases. If there is really nerve tissue destruction there is no way by which regeneration can be secured. If the disease is confined to the vascular system, that is if the symptoms are due to vascular and not parenchymatous changes, then benefit may be expected from treatment. Where the meninges are involved it is also probable that good may be accomplished.

I recall one man who came to me for advice. After examining him I thought he had neurosyphilis with impending paresis. I sent him to New York to consult an eminent neurologist who said it was not parenchymatous but vascular syphilis and advised the administration of repeated doses of arsphenamin by the intravenous method. This man had four series of injections of arsphenamin and during the intervals was given mercury by injection, and I was very much surprised at the end of treatment to note the marked improvement in his condition. He is now apparently well and able to attend to business. If I had assumed that he had paresis I would have made a mistake. This man was thoroughly treated and did not develop paresis.

In the treatment of syphilis I think we should always have the benefit of consultation with a good neurologist.

THE PROPER POSITION OF THE ROENTGEN RAY IN DIAGNOSIS.*

By D. Y. KEITH, Louisville.

The title assigned us is really a question that is easily answered for there is no branch of medicine or surgery in which honesty and ability should be more paramount. If either should stand foremost we would prefer sacrificing ability to honesty.

There is no field of medicine or surgery in which there are so many opportunities to practice dishonesty. No one who has not been closely associated with Roentgen diagnosis knows how very much information is expected from the Roentgenologist by the average practitioner.

The major number of laymen that come for examination believe that all of the thoracic and abdominal viscera are visualized and that as much information is to be gained as is possible for us to obtain macroscopically, microscopically and by the delicate sense of touch of the educated fingers of the most skilled surgeon.

Be sure of the integrity and sincerity of the Roentgenologist in whom you trust your examinations and know that you can rely on his reports being as accurate a description

of what he has seen on the screen and film as it is possible for him to describe. Remember, if you do this you will have rendered your patients greater service than by having some one of greater ability though not honest. If it is possible to combine the two virtues in your Roentgen consultant, the higher your percentage of accurate diagnosis will be.

We trust these few remarks have not led you to believe the Roentgen method is not of the greatest aid and comfort in diagnosis. We know of no one procedure by which so much information is to be obtained, but beware of the eye that sees more than is present on the screen and film.

For discussion it is practical to have the following divisions:

1. Localization of foreign bodies in the eye.
2. Head and nasal accessory sinuses.
3. Chest. Cardiovascular and respiratory symptoms.
4. Gastro-intestinal tract.
5. Genito-urinary tract.
6. Osseous system of foreign bodies.

All of which we believe will soon be practiced as special lines in Roentgenology.

FOREIGN BODIES IN THE EYE: Here we receive double value from a Roentgen examination, viz., the presence or absence of a foreign missile and its accurate location which makes the object so easily removed by the oculist if the missile is magnetizable.

The following brief report on two cases will show the great value of an accurate localization in a positive case as well as the value in a negative case.

Case 1. Referred by Dr. S. G. Dabney.

Mr. J. Age 28 years. Struck in the eye while hammering a piece of steel eighteen months previous. He consulted an oculist and was sent home. No Roentgen examination made. A few months later he consulted another oculist and was rayed, the report being that a foreign body was present but outside of the eyeball. When examined by us the foreign shadow was localized and the following report given:

X-Ray examination of the left eye with Fox localizer in situ shows a small foreign body shadow about the size of a blackberry seed in the lower-outer quadrant of the eye and in the lower-inner portion of this quadrant approximately $\frac{3}{8}$ of an inch from the anterior surface of the cornea.

A few days later this minute missile was removed by Dr. Dabney and the eye saved. Months have elapsed since removal.

Case 2. Referred by Dr. A. O. Pfingst.

*Read before the Kentucky State Medical Association, Lexington, September 27-30, 1920.

Master. Age 15 years. Struck in the eye with some portion of a cartridge that exploded immediately underneath his eye. When Dr. Pfingst telephoned us he said the traumatic evidence present and the history was such that it was a 1000 to 1 chance that a foreign body was present but he wanted to have a positive plate before the eye was removed. Much to our surprise no foreign missile was found and a useful eye was obtained. Had the Roentgen Ray not been used it is certain the removal would have justifiable from the history and amount of trauma.

The value of good technical films in teeth and nasal accessory sinuses cannot be over-estimated though our experience of the past three years has not changed our opinion since our presentation of this subject at the annual meeting in 1917 which appeared in the April, 1918, issue of the KENTUCKY MEDICAL JOURNAL.

MASTOIDS: The improvement in technique in mastoid examinations is such that we are sure *no* operative procedure should be attempted in any case of mastoiditis either acute or chronic until a perfect technical film has been made of each mastoid. In the acute cases it is not of service always in diagnosis but certainly reveals the amount of cell wall destruction, the character of cell and if any zygomatic or accessory cells are present. The mastoid cells of opposite sides match in type, size and shape as much as eyes or ears of that particular individual. By seeing the type of cell it is of great aid in prognosis. The pneumatic type affords better drainage and better prognosis without operation. Invaluable service to the operator is gained as he knows the extent of the cell development as well as the location. Dr. Dabney in a paper presented before the Jefferson County Medical Society places it first among laboratory aids in diagnosis of mastoiditis, stating in obscure cases it has been of great assistance in deciding for or against operation and to the present time he has not been misled. We believe if he is ever misled it will be on improper Roentgen reading or poor technical films.

Ventriculography or air injection into the ventricles of the brain is invaluable and Dandy (1) (2) has shown that an examination is not complete unless ventriculography has been used in a case of suspected tumor. He has definitely located tumors of cerebrum and cerebellum by this method that were not located by expert neurological examination of the neurological surgeon. In one case the tumor was the size of one's fist and located in cerebral hemisphere though not detected at examination or at operation.

Roentgen evidence of brain tumor without this method is shown in the hypophyseal tumor by destruction of the sella turica and in other tumors by deposits of calcium salts within the tumor mass. This unfortunately does not occur early and when present it is usually too late for operative removal, which is the only method of treatment that is of any service. Neither Radium or X-Ray has any proven value in brain tumors. Hydrocephalus is recognizable upon a Roentgen plate or film in a large percent of cases.

In chest examinations the fluoroscope and stereoscopic films should be used in most every case to have a complete or thorough examination. Our experience with a number of leading internists is that invaluable information is to be gained by the Roentgen examination that cannot be obtained by any other method. This is especially true of the early lesions of the lung fields and where both lungs are affected.

In long continued, chronic cases the extent of fibrous infiltration and calcium deposits can always be shown that cannot be positively proven in any other way.

In localized empyema, lung and mediastinal abscess, the size, localization and amount of tissue destruction is of inestimable value and unquestionably has saved many lives by its aid to the expert surgeon.

By bismuth injection of old abscess cavities and fistulae that surround them they are beautifully visualized.

In treatment by pneumothorax the detection of adhesions is so clearly seen that no case should be treated without the use of the fluoroscope. Many causes for incomplete collapse of the lung are seen as well as to show the fallacy and danger of an attempt at lung collapse.

More than a score of years ago when Cannon visualized the gastro-intestinal tract of some of the smaller animals (goose-cat) no one dreamed the digestive tract would ever become as easily and as often visualized as it is today by the modern instruments and opaque barium meal.

It is real conservatism today to say that no chronic ailment of the digestive system should go to operation without first having a Roentgen examination by a competent Roentgenologist, making use of both the fluoroscope and Radiographic methods. This part of the examination should only be entrusted to the medical man who has had special training in fluoroscopic technique. The health of the human family we trust will never become so commercialized and cheap that this important part of the examination is handed to the laboratory technician regardless of

how expert he or she may be on Radiographic technic.

During the last year Stein and Stuart of New York (3) and Orndorff (4) have shown that by inflating the peritoneal cavity with oxygen that nearly all of the solid organs of the abdomen become visualized. By this technic the uterus, tubes ovaries, kidneys, spleen and liver are easily shown, the only disappointment being the gall bladder cannot always be visualized. Post-operative adhesions which are usually omental and to the anterior abdominal wall are beautifully seen as well as the adhesions of tubercular peritonitis. This method is a hospital procedure and quite uncomfortable to the patient in many instances. The oxygen is usually absorbed from one to seven days.

More recently of California (5) has used nitrogen gas and makes the examination an office procedure as the nitrogen is completely absorbed within thirty or forty minutes.

To these procedures Orndorff has added peritoneoscopy which is direct vision of the peritoneal cavity by an instrument with an electric lighting system similar to a cystoscope. The instrument is inserted into the abdominal wall through a cannula, the opening having been made by a large trocar. This procedure is of service in tubercular peritonitis and hemorrhage into the peritoneal cavity but it is doubtful if the procedure will ever become practical.

GENITO-URINARY Roentgenography is more accurate than any other portion of our anatomy except the osseous system. With the present technic it is possible to get a kidney outline on every case and this rule should be lived up to.

A simple Roentgen examination will give you the following points: Presence or absence of renal calculi, unusual amount of calcification which is always suspicious of renal tuberculosis, enlargement of the kidney, and occasionally cystic or localized renal abscess can be detected.

Pyelography which is the demonstration of the bladder, ureter, kidney, pelvis and calyces by the injection of substances which are opaque to the Rays. Thorium nitrate (10%-15%) and a solution of sodium bromide are the substances most commonly used at present. This should be done by someone who has had special training and even then it is not entirely devoid of danger. Kidney anomalies, distortion, kinking, redundancy or diverticulum of ureter or bladder, size and shape of the bladder, malformation or enlargement of the kidney pelvis, identification

of shadows within the kidney outline or demonstrating they are extra-renal.

In doubtful cases the opaque ureteral catheters are of great service and occasionally stereoscopic plates with the opaque catheters in situ are of great service in order to differentiate a gall stone shadow from renal calculi shadow.

If this amount of work is done in an earnest painstaking manner by competent workers a positive diagnosis will result in the major portion of the cases. Negative diagnoses in the presence of a typical clinical history requires greater care and better technical films than the positive renal calculi cases.

No surgeon at present ever attempts operative work upon either kidney or ureter until the condition is demonstrated upon the films. Extra-renal shadows in a few instances have been demonstrated fluoroscopically to be outside of the kidney shadow area.

When pneumoperitoneum is combined with cystoscope, opaque catheters and pyelography it seems but few of the kidney affections should go unrecognized.

OSSEOUS SYSTEM: We know no one doubts for a moment the service and comfort to both patient and physician in fractures, dislocations and suspected bone injuries. Real economy is seen in the daily use of the Roentgenogram to the working man. The proper prognosis as to the time of disability, whether temporary or permanent and the probable amount of deformity if any is to be expected, can be seen in an instant by the trained Roentgen eye and with a fair degree of accuracy after a few years' experience.

The fluoroscope has proven to be of great service in fractures of the forearm, wrist, leg and ankle. In fractures of the femur and arm it is difficult to obtain but one position and this is not to be relied upon except for overlapping at the site of fracture and only by one who has had considerable fluoroscopic experience and realized how very deceptive shadows can be.

The better one becomes acquainted with bone infections the more the X-Rays are appreciated. This method of examination should be used in every case where pain persists in any anatomical region for a short period.

The cause of many cases of chronic rheumatism is easily explained when bone destruction is shown on an X-Ray film.

The spinal anomalies and infectious osteitis of the vertebra can be clearly demonstrated by which the orthopedist can decide if splint or surgical interference are indicated.

Luetic or tuberculous infection is easy to

differentiate for tuberculosis is primarily an arthritis with bone destruction while in syphilis you see both bone destruction and bone production. In films it is easy to file with the case record and can be referred to when desired to note the improvement if any is present.

Pain following slight bone injury that is not at first recognizable on the Roentgen film should be Rayed at intervals of a few weeks if the pain persists for in cases of slight injury is where we see so frequently bone tumor or early tuberculosis infection.

Abnormal types of osseous development with the resulting deformities are shown and are of great service from a diagnostic viewpoint as well as the treatment to be instituted to overcome these deformities. Delayed ossification or abnormal osseous deposits are also demonstrated.

The various forms of arthritis with the clinical examinations and history make a positive diagnosis possible in nearly all cases where careful Roentgen examinations have been made.

CONCLUSIONS.

1. Accurate localization of all foreign bodies is invaluable. Particularly is this true of the eye.

2. No mastoiditis should go un-Rayed both from prognosis and operative value.

3. Combined stereoscopic and fluoroscopic examinations will reveal more than physical examinations. Early evidence of aneurism or respiratory blocking can be demonstrated.

4. A case of chronic indigestion should have the benefit of the Roentgenologist before operative measures are instituted.

5. Scientific diagnosis can be made in most cases of the genito-urinary system if Roentgenological cystoscopic, pyelographic (including the fluoroscope) are properly used.

6. The value of Roentgenological findings in bone injury or bone disease cannot be overestimated.

7. The greatest value must be placed upon the workers who are most earnest, painstaking, diligent and whose integrity and ability are unquestioned.

NOTES.

1. American Surgery, July 1918. 685.
2. Surgery Gynecology-Obstetrics. April 1920. Vol. XXX, No. 4.
3. American Roentgen Journal.
4. American Roentgen Journal.

DISCUSSION

James B. Mason, London: I have been very much gratified to listen to Dr. Keith's paper,

which is certainly an excellent review of the recent literature on roentgenology. The results which you obtain on the roentgen ray, like your work in other fields, bear a direct relation to the care, the skill, the technic, and the ability of the man who does the work. You cannot stick a patient up before a fluoroscope and expect to see a gastric or duodenal ulcer pop up before you like the hand on a sign board pointing which way to go. You cannot expect without proper work to show your gall-stones or a stone in the kidney or the bladder, or a calculus at any point; but if you will devote sufficient time, if you will make a sufficient number of plates, there will be but few of these things that will escape you. You cannot diagnose every gall-bladder case by the x-ray. I do not want to make a statement here giving percentages at all, but I want to recall a case which was operated on by Dr. Frank some four or five years ago. The patient was a woman in whose case there was some question as to whether there was a stone in the common duct or malignancy. Dr. Frank, as I remember, as well as every one else who had seen the case, was inclined to malignancy. Is that correct, doctor? Do you recall that case of the old lady?

Dr. Frank: Yes.

Dr. Mason: I said to Dr. Frank and to the other doctors in the case, that I found two calculi approximately the size of the end of my thumb. Dr. Frank operated on that case, verified the x-ray findings, the patient made a perfect recovery and only recently died of some heart trouble.

In some of your joint lesions, you cannot show or expect to show the trouble from a single plate; but if you will take time to make stereoscopic plates, you will not let many joint lesions get by you.

I have had a little experience with injecting the peritonium, and I do not believe it is a matter to be undertaken lightly. I believe there is some risk attending it. I do know that these patients suffer intense pain unless you put them to bed, and I may have used a larger quantity of oxygen than was necessary, but they suffered great discomfort; and if you put them in the upright position you get a circulation which may not alarm the other fellow, but it does me if they are in my hands.

John W. Scott, Lexington: One reason for disappointment in the results of x-ray diagnosis is the reluctance of the general practitioner to subject his patients to an expensive procedure with the probability of a negative report. That is a necessary condition. One expects to get a large number of negative Wassermanns; he expects nothing but a negative report in the great majority of the cases. The same thing is true of the x-ray. The man who has a questionable

chest case does not send him for x-ray examination. He is apt to take it for granted from his examination, which is more or less reliable, that the case is not tuberculous. He selects for x-ray examination of the chest cases in which the evidence from history and physical diagnosis leaves no uncertainty. Moist rales over the fourth rib you can diagnose with the clothes on. To subject such a patient to an x-ray examination is entirely unnecessary. It is much better to subject the doubtful, borderline cases to such examination. However, where expense is not a factor all these cases should have the benefit of this very essential diagnostic aid.

In regard to the x-ray in examining the gastrointestinal tract, and particularly the gall-bladder, it is well known that in the hands of most men a very small percentage of cases of stones in the gall-bladder can be demonstrated directly, but there is in the great majority of cases strong indirect evidence which is confirmatory of inflammatory disease in the right upper quadrant of the abdomen. As Brown, of Baltimore, has pointed out, this is more than a suggestion, there is a very characteristic tendency of the pylorus to be attracted to that quarter of the abdomen in which the acute inflammatory process is present. It shows on the fluoroscope and on the plate. There is a drawing up, not by adhesions, of the pylorus. He thinks there is a sort of chemotactic process attracting, as it were, pylorus in that quarter of the abdomen in which the inflammatory process occurs. I think this is of more general value than finding or not of stones on the plate.

Louis Wallace Frank, Louisville: The only point of which I wish to speak is concerning ventriculography with the injection of air into the ventricles. There is no question that in the hands of Dandy, who introduced this method, ventriculography has been successful in many cases. The operation of introducing air into the brain is not as easy as it sounds. The needle is pushed through an intact dura and the operator does not know but that he may be puncturing large pial vessels. Blood vessels deeper in the brain tissue may be injured and hemiplegia may or may not result. Such has occurred in the experience of one of my own friends.

Furthermore, it is not so easy to put the needle into the ventricle. In one case which I operated marked herniation followed a temporal decompression and I attempted to empty the ventricle. The needle was introduced several times but no fluid obtained. I felt certain that my opening was on the same side as the tumor, and subsequent autopsy proved that my assumption had been correct. Such an occurrence may happen in doing a puncture to introduce air into the ventricle, in which case a second puncture must be made on the opposite side.

C. C. Coleman, Richmond, Virginia: It seems to me that the most valuable lesson to be derived from the timely paper of Dr. Keith is that X-Ray study should be preceded in nearly all cases by a careful clinical examination. In other words, the value of the X-Ray examination is in direct ratio to the amount of clinical study expended on the patient. It is absolutely necessary to get the interpretation of most X-Ray plates from the Roentgenologist, but at the same time it seems desirable that the clinician who is familiar with the manifestations of the patient's disease should go over the plates with the Roentgenologist. This cooperation between the clinician and roentgenologist is highly essential in the study of head cases.

Localized intracranial bone changes, as shown by the X-Ray may be due to a cerebral lesion far removed from the location of the bone changes.

In reference to ventriculography, this addition to the X-Ray methods must be regarded as a procedure attended with danger, and one which should be employed only after all safer methods of diagnosis have failed to furnish the desired information. In reading Dr. Dandy's reports one is convinced that unless this procedure of injecting air into the ventricles can be performed with a degree of skill that Dandy has, it had better not be undertaken except under urgent indication and with a full realization of the known risk. Ventriculography apparently finds its greatest usefulness in lesions that obstruct or encroach upon the ventricles. Such lesions are not removable in many cases. There are cases of brain tumor in which we would not dare to do a spinal puncture because of the danger of herniation of the medulla into the foramen. Without a presumptive localization of a lesion above the tentorium, the withdrawal of fluid from the spinal subarachnoid space and then attempt to replace this fluid with air would very likely be subjecting the patient to a risk out of proportion to the value of the procedure. Undoubtedly the procedure has value in certain conditions but the dangers of its employment should not be lost sight of.

Leon L. Solomon, Louisville: It appears to me, not as an x-ray expert, but as a clinician, who owns and has constant access to x-ray equipment in his office, that the proper place for the Roentgen Ray in diagnosis, is as a corroborative instrument of precision, to assist in the proving of the physical findings. It is true that, at times, the x-ray alone makes the diagnosis, without the physical. For instance, a boy swallows a pin and comes into the office, telling you he has swallowed it. He does not say the pin is in his breathing passages, that it makes him cough or otherwise disturbs his breathing. He says, "The pin is in my stomach. I feel it there; I know I swallowed it." He knows he swallowed

it. The boy is old enough to tell you the facts and you prepare to search for the foreign body in the digestive tract. Such a history would naturally lead you to believe the pin would be found in the stomach. You make the usual physical examination of the youngster, without being able to throw any light on the location of the foreign body. It hardly occurs to you, with such a history, that a sharp pointed pin could be in the respiratory passage. There is no evidence of irritation in this tract; no rales, no cough, no dyspnea, no pain. The x-ray **makes** the diagnosis in the case in spite of the history, and quickly makes it. You find the pin, not in the stomach, but in a bronchial tube. I have seen such an instance, where I could hardly believe my own eyes, though the x-ray was correct.

I was present and heard Dr. Dabney, when he paid a high tribute to Dr. Keith, for assisting him with the x-ray in his diagnosis of mastoids. It occurs to me that the x-ray—and I repeat now what I then said, before the Jefferson County Medical Society—I repeat the x-ray is not used often enough in daily practice. When a physician brings a patient to the x-ray laboratory, he does not say to the technician, "help me to make this diagnosis," but he rather says, "make a picture of this case for me," which means make one picture. The x-ray technician is thus handicapped. Often, he would like to make half a dozen pictures, in order to reach a dependable conclusion. The fault is, we do not sufficiently often make use of this splendid means of assistance, to **make** the diagnosis or to **corroborate** the diagnosis. In routine practice, we do not resort to the Ray nearly as often as we should. I have frequently discovered through the x-ray, lesions in the lung when I wondered why I did not find them by the carefully made clinical examination. Dr. Scott, to the contrary, notwithstanding, the carefully made physical of the thorax does not always reveal all the things we would expect it to, but the x-ray usually makes them perfectly plain.

Have your cases x-rayed; hold the technician responsible for his findings. Tell him it is not a picture you desire him to make, but rather a diagnosis. Ask him to **make** the diagnosis for you, to **assist** you in making it, or to **corroborate** it, if your physical has already made it clear.

D. Y. Keith (closing the discussion): I should like to draw attention to the stereoscopic plate referred to by Dr. Mason. No patient goes out of our office following an examination of the lungs without a stereoscopic plate. We are quite sure of what Dr. Solomon said, namely, you will find a great deal more on the plate, when properly read, than you will find by physical examination.

As to ventriculography, I have given a review

of the literature on that, and no suspected tumor of the brain is complete without it. Dandy, in an article in Surgery, Gynecology and Obstetrics for April, 1920, says that he has had 70 or 80 cases without any bad effects. Certainly, we all agree that he is an expert along this particular line. He has removed a tumor the size of a man's fist, although he had operated on other cases and did not find the tumor. There is reference made to another operator who had operated on the same patient and did not find a tumor. To say that he removed a tumor and the patient was alive and well two years thereafter ends any argument. A man that has a tumor of the brain, is blind, and has several symptoms that go with it, does not care what happens. If I had a suspected tumor of the brain, I would not be willing for Dandy to operate on it. This certainly explains the seriousness of the operation. There is no question but that it is a serious operation to attack the ventricles of the brain. For my part, I would be perfectly willing for someone else to do it for me, as a brain tumor is hopeless without surgery.

As to pneumoperitonem, if you will talk with some of the men who have done it, not x-ray men, but surgeons and gynecologists, you would be led to believe that it is a simple operation. They are using it at the present time at Ann Arbor, Michigan. They take an ordinary gas bag and fill it full of CO₂, and the gynecologist injects the patient, and a stereoscopic plate is made without using any measures to prevent pain, and the control of pressure is regulated by a man holding the bag between his knees. The patient is up and about in forty minutes time. Three hundred cases have been reported in which morphin has been used beforehand. The patient comes in quite often and in thirty minutes is out of the office and has no trouble whatever. With CO₂ the time factor and hospital factor are eliminated.

There are certain indications and contraindications you should respect. These are to be found in the original papers on ventriculography and pneumoperitonem, and those who are interested will find them described in the literature.

Treatment of Hemoptysis.—Divito injected normal horse serum to arrest hemoptysis in a number of tuberculous patients, and found that marked improvement followed an anaphylactic shock. He has given this treatment to sixty patients during the last ten years and regards the effect as very encouraging. He thinks that tuberculin treatment and also artificial pneumothorax owe their efficacy to the reactions which they induce in the blood serum. He asserts further that anaphylaxis is not so formidable in the tuberculous as under other conditions, perhaps.

END RESULTS IN SURGERY OF GASTRIC AND DUODENAL ULCER.*

By LOUIS FRANK, Louisville.

The discussion of gastric and duodenal ulcers, particularly from the standpoint of end results, should be of intense interest to both surgeons and general practitioners. It is a topic with which each is peculiarly concerned.

Fifteen years ago I had the honor and pleasure of delivering the oration in surgery before this association, and at that time chose the subject of chronic gastric ulcer upon which to address you. As time has passed and our experience become ripened and opportunities for personal observation enriched, the opinions then expressed have become deeper ingrained and I have seen little or no reason to alter or amend them. At that time we had only a few cases upon which to predicate our remarks, and even now, in comparison with the wealth of material of the Mayo and other clinics of great renown, our own experience continues quite modest. Abundant literature, however, is at hand to fortify our deductions and enhance our convictions, and of this we have made extensive use in the preparation of this paper.

Any curative measure or treatment offered for disease must stand or fall upon its ability to ameliorate the symptoms or eliminate the pathology for which its application was conceived and upon which its therapeutic is based. In surgery the procedure must also possess a certain degree of safety for the patient; but neither the safety of an operation nor the brilliancy of its conception or execution play any part in its ultimate acceptance, all depends upon the value of the procedure as a curative factor.

In the field of gastric surgery our methods of treatment are well-nigh perfected, yet an analysis of final results offers some excuse for an argument with the internist. Whether or not the medical side has a sound basis will depend upon how much weight is attached to either side of the argument. As surgeons we must confess that the end-results are not exactly as we would like them. In discussing figures many of us have a way of making "off-hand" statements as to results which are not confirmed by critical study. As Coffey says: "It is with a spirit of deep humility that the surgeon discusses end results of the surgical treatment of ulcer, for these are by no means so good as we would

like to have them, and, like the internist's statistics, the surgeon's are also very inaccurate and variable." A careful study made by him of the collected cases by Deaver including his own, by Lockwood who quotes the statistics of Bettman and White, by Graham from the Mayo Clinic, by Joslin, von Eiselsberg, Peck and others, shows fairly satisfactory results in about eighty-five per cent of cases. These figures include not only patients absolutely cured but those much improved, and whereas eighty-six per cent satisfactory is shown in duodenal ulcer, in gastric ulcer it is only eighty per cent, the absolute cures varying from fifty to seventy per cent. The word cure, however, is largely a relative term, and Mayo discussing this says that "the patient who seeks relief from distressing symptoms cannot always appreciate a practical cure. To cure is relative, and depends on various conditions; first, general nervous stability; second, the pathological condition present; third, the extent of this condition; fourth, the proximity of the lesion to vital tissues; fifth, the extent of operation necessary to remove the diseased tissue; sixth, coincident disease; seventh, the patient's power to react. These factors enter into consideration when treatment, especially surgical, is to be instituted. The patient may be, and often is, freed from disease and life prolonged; yet he may not be freed from symptoms quite distressing. This is not always the fault of treatment, but an inevitable result of the pathologic condition occurring before treatment was undertaken."

We might add that other things must be considered in studying the outcome of surgical treatment for gastric and duodenal ulcer, the operator and his experience being not the least of these. Upon his experience will depend the precise method of surgical attack which certainly in a limited number of cases may vary to a considerable extent. While it is true in the vast majority of instances a gastroenterostomy may be all that is necessary, and in early simple ulcers this is all that is required, in old indurated ulcers at the pylorus quite a different plan may have to be followed to effect complete cure. We have, again, quite a different proposition in chronic perforation of the duodenum, or in dealing with a large ulcer on the posterior wall of the stomach, which may have the pancreas as its base. If we assume that a simple gastrojejunostomy will relieve all of these, that it will act similarly under each of the above circumstances, then our conception of the treatment of gastric and duodenal ulcers is amiss and our results will not be satisfactory. The surgeon doing gastric sur-

*Read before the Kentucky State Medical Association at Lexington, September 27-30, 1920.

gery for ulcer must have no set rule or absolutely fixed plan of attack, but must be prepared to vary his operation dependent upon the condition with which he is confronted.

Peck says: "that the brilliant work of contemporary surgeons has demonstrated that such lesions are curable in the majority of instances by properly selected surgical procedures, and that restoration to health may be perfect and permanent. That this happy result fails of achievement in some instances places a burden of heavy responsibility on one who in case of failure must review his procedure and determine whether the fault lies in any error of judgment in selecting the mode of treatment or in the execution of some point in the technique." Errors of judgment are also made in diagnosis in that symptoms and x-ray findings are not correctly interpreted. These must be quite numerous judging from the Rochester statistics, and our own experience has been that x-ray interpretations are at times not confirmed by the operative findings.

At the Rochester Clinic the records show that more than three hundred unnecessary gastroenterostomies have been released in which there was no evidence either in the history or in the condition found at the second operation that ulcer had ever existed. To show that "accidents may happen in the best regulated families," fourteen of these patients were primarily operated upon at the clinic. It therefore behooves the surgeon not only to have sufficient data upon which to base his exploration, but to recognize the existence of the ulcer or its absence at the time of operation. It is equally true that the inexperienced overlook ulcers and that those of widest experience most easily recognize ulcers which would be unsuspected with stomach or duodenum exposed by the occasional or infrequent operator.

As has been intimated in the foregoing, the ulcer being recognized and its sequences and extent having been determined, the operation must be of the proper type and correctly performed. We are absolutely certain that many patients suffer discomfort and that not infrequently a simple gastroenterostomy terminates in disaster on account of not being correctly performed. While the procedures for the treatment of duodenal and gastric ulcers are well-nigh standardized, it is remarkable how often imperfections in technique may be observed and how frequently an operation may be improperly executed. Simple as some of these operations may seem, their performance in such manner as to yield perfect results is not always accomplished.

The mechanics of a gastroenterostomy must

be perfectly understood, as upon this depends in a measure the cure by gastrojejunostomy. The cure, however, is not entirely mechanical but has a physiological basis as well. Drainage of the stomach must be secured, but fertilization, as Chas. Mayo says, is also necessary, and this cannot be accomplished unless there is a flow of bile into the stomach to neutralize the acidity. Thus, Paterson found in his series of cases that the total acidity was diminished thirty per cent, and he believed that the cure was largely due to this neutralization. It is for this reason that simple excision of small ulcers without pyloroplasty or drainage procedure has not been accompanied by good results.

We have always combined our excisions whether knife or cautery with gastroenterostomy, and believe from our observations this is the preferable method. While we have performed a few trans-gastric excisions of ulcers without gastroenterostomy, our good results are probably to be attributed more to luck than to skill.

It is sometimes difficult to decide exactly what should be done. In one of our own cases an enormous indurated ulcer on the posterior wall has been relieved for two and a half years by a trans-gastric operation with wide excision of the margins of the ulcer and direct suture.

In simple ulcers it would seem that the best results are now obtained by cautery excision and a drainage procedure. From Balfour's study there seems to be decidedly less interference with motility in cautery than in knife excision, and also a decided lessening of late hemorrhage which is an actual danger. In advocating cautery excision Balfour gives the following conclusions:

- (1) The ulcer is destroyed, and with it any early malignancy which may exist.

- (2) There is little sacrifice of sound gastric tissue and secondary contraction is therefore minimum.

- (3) Hemorrhage early or late is with practical certainty prevented.

- (4) Its simplicity, speed of accomplishment and safety.

Scudder and Harvey have shown that while there is, by the use of the cautery, a slightly greater amount of tissue sacrificed, repair is not delayed and suturing is attended by the same reparative process as following the knife excision. They believe, of course, that a gastroenterostomy should always be done. Peek also thinks that some method of treatment by excision is the best plan. With the excision, particularly in gastric ulcer, which has been shown to be far more serious not only immediately but in its late results than

duodenal ulcer, we have the question of malignant development to consider. This is a danger which is by no means small. Though Kocher and Gressot report only three per cent of carcinoma in their cases, von Eiselsberg records ten per cent, and a larger percentage is shown by Mayo.

Other sequelae of gastric ulcer must also be remembered. We refer to hour-glass stomach, in which there may or may not be an active ulcer present, and pyloric obstruction which is a common sequence of ulcer near the stomach sphincter. True it is that some of these latter, under the impression that they were cancerous, have been entirely cured following gastroenterostomy; yet our own practice has been to do a resection either of the Billroth or preferably of the Polya-Balfour type.

In duodenal ulcer such sequelae are not noted, and our plan in the treatment of these cases has been simple gastroenterostomy with infolding of the ulcer, unless there was marked induration, when excision and pyloric exclusion has been practiced. We think the latter procedure will be rarely necessary.

What has been the outcome of these cases? Peck, in a study of seventy-four cases of duodenal ulcer, seventy-two of which had been treated by a simple gastroenterostomy, shows fifty-one cures in a total of fifty-eight cases which were traced. This is a percentage of eighty-eight, or if calculated on the basis of the seventy-four cases would show 68.9 per cent as cured. In Buttner's series of eleven hundred operations for ulcers of the stomach and duodenum, including those presenting hour-glass contraction, pyloric stenosis and active ulcer, there were sixty-five per cent cured. These cases were all treated by gastroenterostomy.

In a recent discussion of the end-results in the treatment of ulcers, Mayo says: "Let us bear in mind that ulcers of the stomach and duodenum as they are seen by the surgeon are chronic diseases that have been treated medically for years. I have been asked when does a chronic ulcer of the stomach or duodenum become surgical. For various reasons the answer has been: after nine complete and perfect medical cures. With regard to the question of failure to cure surgically I would put it down as a Hibernianism that the first cause of failure in doing an operation, gastroenterostomy usually, on a patient who has no ulcer."

CONCLUSIONS

I. Gastric and duodenal ulcers are distinctly amenable to and best handled by surgical treatment.

II. In from 75% to 85% the results of surgical treatment are quite satisfactory to the patient.

III. Many of the failures to completely relieve are due to delay in instituting surgical intervention.

IV. Failures are also due to incorrect diagnosis and to the performance of gastroenterostomy when no ulcer is present, the cause of the digestive disturbance being other than ulcer.

V. In the presence of ulcer, lack of cure may also be the result of imperfect technic or of an incorrect type of operation, thereby leaving the way open to post-operative complications or sequelae as jejunal ulcer or carcinomatous engraftment upon the ulcer.

END-RESULTS FOLLOWING OPERATIONS UPON THE BILE PASSAGES.*

By GUY AUD, Louisville.

An analysis of the results following operations upon the bile-passages brings out many interesting facts, not the least interesting of which is the difference of opinion that still exists as to the operation of choice in certain definite pathological lesions. The old familiar discussion of cholecystectomy versus cholecystostomy has been productive of a great deal of good and has clarified the situation to a large extent by stimulating investigation and more careful observation.

We all realize that there are many factors concerned in the end-results of operations upon the bile-passages, none of which is of greater importance than the skill and surgical judgment of the operator. The degree of infection present is of utmost importance and is probably the greatest cause of recurrence of symptoms. The patient's ability to withstand operation; the extent of involvement of the bile-passages; the failure to recognize certain anatomical abnormalities of the blood-vessels and bile ducts, and the inability to remove all the stones, as may occur occasionally with stones in the hepatic ducts, all play a very vital part in obtaining a cure.

The importance of early recognition of surgical conditions of the bile-passages cannot be emphasized too strongly because of the complications which may result from the disease and the unlimited effects of delay. According to Deaver (1) the operative mortality rises directly with the gravity of the superadded conditions. In acute cholecystitis the figure ranges from 2 per cent to 4 per

*Read before the Kentucky State Medical Association, at Lexington, September 27-30, 1920.

cent; when complicated with common duct obstruction, it rises to 5 per cent; and with pancreatic involvement it reaches 9 per cent. He further states that early operation in chronic cholecystitis is comparatively simple and the end-results 95 per cent satisfactory as far as a complete cure is concerned. But when the bile passages are involved we are confronted with a procedure which ranks high among technically difficult operations and the end-results are less satisfactory.

Everyone who has had an opportunity of observing a large number of these cases realizes the futility of prolonged medical treatment. We know that a certain per cent will show improvement; and a temporary relief of symptoms, but that a medical cure is impossible as the treatment cannot reach the seat of trouble. Conditions that fail to respond to treatment within a reasonable length of time should be seen in consultation with a surgeon in order that the patient may be spared the dangers subsequent to delay.

With the exception of a better understanding of the bacteriology and chemical composition of gall-stones very little has been added, in the past few years, to our knowledge of their cause. All of us are convinced that infection plays a leading part in the production of gall-stones and other surgical conditions of the bile-passages. Carefully taken histories show a surprisingly large proportion to have followed infection; which may extend through the portal, or the systemic circulation, the lymphatics, the common duct, or by contiguity.

Many of the more prominent surgeons no longer believe the function of the gall-bladder to be that of a reservoir. C. H. Mayo and Deaver (2) think it acts as a tension bulb to take increased pressure away from the liver, thus preventing damage from back pressure. They believe it serves to keep up a continuous flow of the bile into the duodenum by its contractions, which occur from 8 to 10 times a minute. Undoubtedly the normal gall-bladder has a very definite function to perform and should never be sacrificed unnecessarily. I am convinced that once it has become diseased it is never capable of functioning normally again and should be removed provided there are no contraindications; as in old people and those with low resistance, in pregnancy, in acute cases with high fever, and in certain diseases of the liver and pancreas. In such cases it is more advisable to do a cholecystostomy. Cholecystectomy is indicated, in fact demanded, in cases of cystic gall-bladder, in strawberry gall-bladder with marked destruction of the mucosa, in empyema, and in impacted stone in the cystic duct, which so

frequently causes obstruction as a result of cicatricial contraction following gall-stone ulceration. In infective conditions of the bile-passages the end-results have been more satisfactory when treated by cholecystectomy with prolonged drainage of the common duct, preferably by means of the T. tube, than by cholecystostomy alone.

Pancreatitis and biliary cirrhosis are best treated by prolonged drainage either through the gall-bladder or common duct. Minute stones imbedded in the gall-bladder can only be removed by taking out the gall-bladder. Occasionally we see a case in which there is jaundice and upon careful examination of the gall-bladder and ducts we are at a loss to account for the severity of the symptoms. Such cases should be treated conservatively as removal of the gall-bladder does not offer any better chance for a cure. A small per cent of patients following cholecystectomy complain of the passage of large quantities of bile by bowel, or of frequent loose stools. This condition usually occurs within the first year following operation and soon disappears.

W. J. Mayo (3) reports two cases in which a tumor developed at the site of the stump of the cystic duct following cholecystectomy of sufficient size to produce obstructive symptoms from pressure on the common duct. He further states that there is a dilatation of all the extra-hepatic ducts following removal of the gall-bladder, due to back pressure. Judd and Mann (4) in a large series of experiments on dogs have shown marked dilatation of the common and hepatic ducts following cholecystectomy but there was no dilatation of any part of the duct if the sphincter at the ampulla (sphincter Oddi) was destroyed at the time the gall-bladder was removed. Deaver (5) in a series of more than 1800 operations upon the bile-passages did not find a single instance in which the cystic duct had dilated following cholecystectomy and does not believe the condition exists.

According to Judd (9) the most common causes of recurrence of symptoms following operations upon the bile passages are: (1) the recurrence or persistence of infection; (2) reformed or overlooked calculi; (3) chronic pancreatitis. In this series of 2027 operations on the biliary tract (not including those for carcinoma) performed at the Mayo Clinic in 1916 and 1917, the mortality was 2.9 per cent. He is convinced that in a majority of cases the results will be more satisfactory if the gall-bladder is removed, though he thinks it has a definite function and should not be deliberately sacrificed unless there is sufficient evidence to show that it is a source of infection. Cholecystectomy

was performed on 1621 cases or 80 per cent with a mortality of 1.9 per cent. Cholecystostomy was done on 82 cases or 4 per cent with a mortality of 8.5 per cent. The increased mortality shown here was due to the fact that the patients could not withstand removal of the gall-bladder and only drainage was done. Of this series 219 or 10.8 per cent were secondary operations with a mortality of 5.5 per cent. In the secondary operations cholecystectomy was done on 120 or 54.7 per cent with a mortality of only .8 per cent. Reconstruction of the ducts was done in 21, or 9.5 per cent. Stones were found at the first operation in 154 or 70.3 per cent, and at the secondary operation in 109 cases or 49.7 per cent. The stones were located in the gall-bladder alone in 90.9 per cent of the cases at the time of the first operation, and in 54.1 per cent at the secondary operation.

About 4 per cent of cases of biliary affections operated upon by Deaver (7) at the German Hospital of Philadelphia, were secondary cases, 60 per cent of which required re-operation within one year after the primary intervention. He gives as the most common cause of recurrence of symptoms following operation: (1) stone in the gall-bladder, (2) adhesion, (3) stone in the common duct. Failure to remove all the stones at the primary operation is the most potent cause of recurrence of symptoms. He regards free and prolonged drainage of the biliary tract as the best method of overcoming recurrence.

There are instances in which the pathology is so extensive as to obliterate the anatomical landmarks to such a degree that injury to the blood-vessels and biliary tracts can be prevented only by a careful dissection of the structures contained within the gastro-hepatic omentum. Unfortunately there is an increasing number of surgical accidents due to the advent into this field of surgery of the occasional operator who has not the proper technique and knowledge of the surgical anatomy of the structures about the foramen of Winslow to recognize the frequent anatomical abnormalities that exist in the blood-vessels and ducts, nor the ability to deal with them properly when encountered. Eisendrath (8) in a recent article shows very clearly the wide variations from the normal of the distribution of the blood-vessels of the biliary region as well as the unusual modes of union of the bile ducts. He shows that the right hepatic artery varies greatly in its relations to the main hepatic and cystic duct. That there is a single cystic artery in only 88 per cent of individuals. That in only 75 per cent of individuals do the cystic and hepatic ducts

unite at an acute angle. In 17 per cent the ducts pursue a parallel course before they unite. In 8 per cent the cystic duct takes a spiral twist around the front or back of the main hepatic duct before they unite to form the common duct. The most common modes of injury given by him are: (1) tear, ligation, or division of the main hepatic duct during cholecystectomy; (2) common duct resected; (3) a resection of the junction of the cystic, hepatic, and common ducts; (4) main hepatic or common ducts ligated or resected during effort to grasp the bleeding stump of a cystic artery; (5) anomalies of the hepatic duct.

There are no operations which require greater skill and knowledge of surgical anatomy than those of repair of injuries to the bile-passages. The results are surprisingly good in most instances, especially if the injury is recognized and repaired at once. Secondary operations for the repair of such injuries are much more difficult because of adhesions and contraction of scar-tissue and usually the patient is in poor physical condition to withstand such a formidable operation.

SUMMARY.

1. Early recognition of surgical conditions of the bile-passages is of utmost importance because of the complications which may result from the disease and the grave effects of delay.

2. Once the gall-bladder is diseased it is never capable of functioning normally, becomes a source of infection, and should be removed provided no definite contraindications exist.

3. In cholecystectomy the greatest care should be exercised to avoid injury to the blood-vessels and ducts in applying the clamps.

4. Failure to remove all the stones at operations and the persistence of infection are probably the greatest causes of recurrence of symptoms.

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DISCUSSION

Irvin Abell, Louisville: I find myself heartily in accord with the substance of the two papers presented to you, so that I can do no more than to emphasize some of the points which they have brought out.

Dr. Frank's paper is particularly interesting since it gives us a combination of statistics of the largest clinics and some of the best operators in the country. It shows that regardless of the type of operation employed, regardless of the methods by which it is done, there is a percentage of cases that are clinically unrelieved. Personally, I have never been able to demonstrate an ulcer of the mucosa of the stomach by gastrostomy. The changes in the overlying peritoneum, as a rule, are such that one will be able to recognize the presence of the ulcer without the necessity for opening it. Naturally my experience, in comparison with the statistics which he has quoted, is a limited one, but I have never been able to detect the presence of an ulcer in the mucosa of the stomach which did not give macroscopic evidence in the wall and overlying peritoneum. I have been able to satisfactorily demonstrate it previous to an incision in the stomach by changes in the stomach wall. It requires not a little judgment and much operative ability to meet the pathologic indications in a given case, as has been outlined by Dr. Frank.

As to pyloric exclusion, regardless of the method, whether by the von Eiselsberg, or resection as an operation of greater magnitude, I personally have always felt that unless there were such pathologic changes present as to indicate its absolute necessity, a prior gastro-enterostomy should always be made. This can be done with a mortality approximating 2 per cent, and it will give symptomatic relief in approximately 75 or 80 per cent of the cases, particularly if we have a definite occlusion of the pylorus by the ulcer scar. We may also feel that relief will be definite and permanent if cicatricial pyloric stenosis is present.

The class of cases that have given me the most trouble have been ulcers at the pylorus in the duodenum, in which there has been no occlusion or obstruction of the pylorus, in which retention of the barium meal will not be over 15 per cent, in which the lumen of the duodenum has not been materially altered. Surely, in a case of that kind, one does not feel justified in doing a resection, and if the ulcer be on the anterior surface, where it can be easily gotten at, its destruction can be accomplished by the cautery or infolding method. This will, in addition, particularly the cautery method, add a certain percentage to the mortality, and it becomes a question for one to determine whether or not the good effects that may result from gastro-enterostomy

justify a man in doing more than that at that time, resorting, if necessary to secondary exclusion, or secondary resection if the subsequent course clinically demonstrates that to be necessary.

I think he has been very wise in emphasizing the necessity of destroying callous ulcers, particularly when we refer to the probability of malignancy developing in those cases. All of us have had the same experience which he illustrated so beautifully in two of his plates, where he has done gastro-enterostomy, with symptomatic relief, to be followed later by the development of malignancy. His patients got complete relief for seven years in one case, nine in another, and then appeared an inoperable cancer which had been engrafted on the site of the old ulcer. That ulcers are cured by gastro-enterostomy is a questionable fact. Furthermore, I think it is quite questionable how relief is obtained, whether it be by neutralization of the acidity of the stomach by impouring of the intestinal juices through the stoma, or due to definite drainage of the stomach by placing the stoma at the most dependent point. The point I wish to make is that gastro-enterostomy does not always cure the ulcer as is evidenced by the records of his two cases which came back nine years after gastro-enterostomy with carcinomatous development at the point of the ulcer. My personal experiences are of the same character, and although the patients are clinically relieved, they still have their ulcer. It brings to my mind that it is a difficult thing to decide always exactly what is best to do, whether a simple gastro-enterostomy with lessened mortality, and a large per cent of relief, or to suggest to the patient a primary mortality of seven, eight, or ten per cent, which exclusion or resection entails, and get rid of the ulcer bearing area with assurance of remaining clinically free from trouble.

Woolfolk Barrow, Lexington: I wish to thank Dr. Frank and Dr. Aud for their delightful papers. It seems to me, that in order to inquire into the end results of any operation we have to consider the diagnosis and the operation itself. I believe the end results depend upon not only the method of operating but on the time the operation is performed.

We heard papers yesterday on cancer, and we have heard today papers on ulcer of the stomach and on gall-bladder troubles.

In Dr. Frank's charts we saw that approximately 75 per cent of ulcers of the stomach were cured by operation. That the mortality from operation where a posterior gastro-enterostomy was alone performed was slightly less than where the ulcer was excised and a posterior gastro-enterostomy was performed. When the pylorus is occluded the mortality rate is slightly higher than when a simple posterior gastro-

enterostomy is performed. In general, there is only approximately a 5 per cent mortality from operation. You take the so-called medical treatment of ulcer of the stomach and it goes on for years, and after a patient has been cured several times of ulcer of the stomach by medical treatment he finally comes to operation. The most important factor about chronic ulcer is to realize that it is a surgical condition. Chronic ulcer should be considered a medical condition only in so far as the diagnosis is concerned. Of course, there are cures from medical treatment, but far more failures.

I wish to say a few words on Dr. Aud's paper. We see many papers written about cholecystectomy versus cholecystotomy. It seems to me that we can have no one method to suit all cases. I have never thought that cholecystectomy should be performed when you have an empyema, with extensive infection of the gall-bladder. In my mind it is a question whether or not you should perform cholecystectomy in all cases of the so-called strawberry gall-bladder. Associated with strawberry gall-bladder you often have pancreatitis and cholangitis. These conditions need drainage. I will admit from reading the literature and from some personal observation that cholecystectomy should usually be performed. I believe most surgeons in these days perform cholecystectomy in 80 per cent of the cases of gall-bladder trouble, but I think the greatest question is the important one of the extent of the infection of the gall-bladder. When you have a strawberry gall-bladder associated with cholangitis and remove it, it is advisable to drain the common duct. I think that merely taking out the gall-bladder is half of the procedure.

Louis Frank (closing the discussion on his part): I just rise to thank the gentlemen for their discussions, and I am glad Dr. Abell emphasized the points that he did. I certainly think our success will depend, as was pointed out by Dr. Aud, on correct diagnosis, and then upon exactly what is done to the patient. One point that should not be lost sight of is that many of these cases suffer on account of incomplete surgery. There may be a local lesion in the stomach or duodenum, and some of these patients show a gall-bladder full of stones. If these are left they will have trouble. If they have a chronic appendix they will also have pylorospasm and further trouble. Often more than the mere operation for the cure of the trouble should be done. The entire pelvis should be explored. First, correct diagnosis, then a correct technic and choice of operation, and finally doing complete and thorough surgery is the only way to get good results from the standpoint of cures.

Guy Aud (closing the discussion: I have very little to say in closing except to say that I think

drainage is of the greatest importance. I believe that on the amount of infection depends a good deal of the character and time of drainage, for in a severe infection cholecystectomy is not alone sufficient and many of these cases also require drainage of the common duct. In some instances this can be done by inserting a small catheter through the cystic duct or by draining the common duct with a T-tube. The degree and severity of infection will have a great deal to do in determining whether or not the gall-bladder should be removed. We sometimes leave in a severely diseased gall-bladder because we may have to fall back on it for drainage later on. These are things we must bear in mind, but given a badly diseased gall-bladder, I believe the results are far better if the gall-bladder is removed than if it is left in. I have seen a large number of these cases at the Mayo Clinic that had been operated on elsewhere by draining the gall-bladder alone and it was gratifying to see them clear up after cholecystectomy. To my mind, once a gall-bladder is severely diseased, it is always diseased, it becomes a source of infection and the sooner you get rid of it the better.

EPIGASTRIC HERNIA.*

By OSCAR BLOCH, Louisville.

Epigastric hernia is the term applied to hernia occurring in the middle line, between the umbilicus and the ensiform cartilage. The first operation for this form of hernia was performed in 1880, while Terrier published an account of this operation first in 1885.

Farrar Cobb, of Boston, in the *Annals of Surgery*, Vol. LV., p. 66, reports a case of chronic diarrhoea which yielded to no form of internal treatment, and was finally cured by operation for epigastric hernia. In his preliminary remarks he says that it has never been taught, so far as he can discover, that chronic diarrhoea can be caused by an epigastric hernia. It has been known that this hernia is not infrequently the cause of gastric symptoms, epigastric and abdominal pain, nausea and vomiting, which symptoms are made worse by taking food or by exertion.

He then proceeds to define an epigastric hernia as a small protrusion, usually not larger than a walnut, situated in the linea alba, between the umbilicus and the xiphoid cartilage. It is rare, occurring in not more than 1 per cent of all hernias; it is more frequent in males. His patient was 69 years of age, white, farmer; he had suffered seven months with constant diarrhoea, having 6 to 13 watery

*Read before the Jefferson County Medical Society.

stools in twenty-four hours. His weight had been reduced from 150 to 110 pounds.

He had been treated by all of the approved internal methods, and by enemata of various kinds, with no results.

The contents of the hernial sac was found to be omentum, which was adherent to the sac and to the parietal peritoneum. The diarrhoea ceased with the operation and never recurred.

In Kiliani's Surgical Diagnosis, one finds a reference to this form of hernia as a special kind occurring in the mesial line, between the sternum and the umbilicus, usually nearer the former. This form of hernia has been mistaken for a small lipoma, which is an excusable mistake, when it is realized that these hernias often consist of small lobules of fat, probably the residuum of fat contained between the layers of the ligamentum suspensorium. These fat lobules may, or may not, draw after them a fold of peritoneum. But even if there is not a peritoneal covering to these herniated fat lobules symptoms of incarceration may be found.

Kiliani further says that these hernias are not rare; that they are easily overlooked on account of their small size; that they are always in the mesial line. He calls attention to the fact that a diagnosis of lipoma might prove to be a fatal mistake if extirpation is attempted as there is always communication with the peritoneal cavity. When the patient is in the horizontal position, these hernias are frequently invisible.

Among the symptoms tabulated, he mentions: Indistinct general nervous depression; inability to attend to intellectual or physical work; digestive disorders; meteorism, eructation, nausea, vomiting, pain in the stomach. These symptoms are more pronounced after meals, and after violent physical exercise, especially after such exercises as require the bending backward of the trunk. Pains are more acute in females during menstruation.

Barker, in The Oxford System of Surgery, in his remarks on epigastric hernia says that small protrusions anywhere in the linea alba between the ensiform cartilage and the umbilicus are occasionally seen and sometimes overlooked; these hernias occur through small spaces between interlacing fibres of the aponeuroses forming the linea alba, and often in patients otherwise well developed.

As a rule, they are not of large size before they begin to give rise to trouble. The pain, dragging or cough appear to be produced by the stretching of the very sensitive parietal peritoneum as it forms a small tight sac. Such a sac rarely, if ever, in his experience, contains either intestine or omentum, but occasionally a small lobe of the latter is found.

This, he thinks, supports the view that the symptoms are due simply to the stretching of the peritoneum.

In some of the cases operated upon a condition has been found which, at first sight, has been a little puzzling; when the protrusion was exposed it appeared to be composed entirely of fat covered by adherent peritoneum and the conclusion likely to be drawn was that the fat was omentum. This fat, moreover, could often be drawn downward to a considerable extent through the little ring in the linea alba, at first strengthening this belief. But in such cases when the fat was carefully divided, it was found that the peritoneal sac lay within it, and on opening this the true peritoneal cavity was seen, with or without a lobule of omentum in sight, but the intestine was almost never seen. In fact the first lobule met with was nothing more than subperitoneal fat pushed before the sac and covered by the transversalis fascia.

The description of Barker's exactly fits one of my recent cases, with the additional fact that the long strip of fat contained a rather large artery which required most careful attention. I decided at that time that this fat was the inclosed portion of the falciform ligament and took particular pains to safely anchor it to the parietal peritoneum above the incision.

Barthelemy, in the March-April, 1920, number of the Lyon Chirurgie, reports 13 cases of epigastric hernia, and notes that the round ligament was frequently adherent to the hernial opening; in his opinion, symptoms common to this form of hernia were due to traction upon the adherent ligament.

Noschowitz, in *Surgery, Gynecology and Obstetrics*, Vol. 18, page 504, has an illuminating article upon The Pathogenesis and Treatment of Hernia of the Linea Alba; I have had his illustrations enlarged to show you and am also making liberal use of his text.

Drawing number one shows the formation of linea alba with its relations to the fascia transversalis and to the peritoneum; number two shows the method of piercing the linea alba by a blood vessel. Since these vessels course between the peritoneum and transverse fascia, they must puncture the fascia to get to their destination, carrying with them an elongation of the fascia, really uniting the transverse fascia and linea alba. This hole in the fascia through which a vessel passes on its way to the surface forms a weak spot and, in Mosechowitz's opinion, requires merely an increase in intra-abdominal pressure for the nearest subjacent structure to be forced into it.

He also calls attention to the attachment of

He also calls attention to the attachment of the falsiform ligament to the abdominal wall and remarks upon the fact that this ligament is composed of two layers of peritoneum enclosing considerable fatty tissue. Drawing number three shows this make-up and attachment of this ligament, while drawing number four shows an epigastric hernia, caused by the entrance through transversalis fascia and linea alba of the fat lobules of the falsiform ligament. He adds that he has never failed to isolate a large blood vessel coming through the hole in the fascia and that a sac is never present.

He describes his simple method of operating upon these hernias; he makes a vertical incision over the protrusion, the fat is isolated, the blood vessel is sought and ligated; the fat is teased carefully, to make perfectly certain that no sac is present; the fat is then ligated and the stump is pushed back in the hole and the opening sutured with one or two stitches as may be needed.

I am very much pleased with his description of the genesis of the hernia and my small experience quite bears out his theory. However, I differ from him in my method of operating; I feel safer to open the peritoneal cavity and to catch the falsiform ligament and make a new attachment for its stump on the abdominal wall just above but adjacent to the operative wound.

Moschowitz closed his article with the statement that strangulation in these hernias was exceptionally rare. In the next volume, page 520, of the same journal, he reports a case of strangulated epigastric hernia; this occurred in a man, 49 years of age, who had noted a swelling for eighteen years midway between the sternum and the umbilicus; this swelling was soft and often disappeared. The hernia became strangulated and the patient came into Moschowitz's service for operation. A true sac was found containing omentum.

Hotchkiss, in the *Annals of Surgery*, vol. 54, page 78, reports an unusual case of strangulated epigastric hernia; this occurred in a male patient, age 63; this man had three hernial openings with omental protrusions in all three and a loop of gangrenous intestine was found in the largest of the openings. I have operated upon four patients with epigastric hernia during the last four months.

One of these came with a diagnosis of hernia or lipoma from a diagnostic clinic; at operation careful dissection around the rounded extra abdominal lobule of fat showed its protrusion through an opening in the median line; this opening was enlarged to a sufficient extent to permit of ligation of the round ligament, with suturing of

the stump to the abdominal wall. This patient's clinical symptoms were mental and physical; he complained of indigestion; pain after eating; belching and irregular appetite. His mental symptoms were such as to make him a neurasthenic suspect. His operative recovery was perfect, with complete abatement of his symptoms.

Another patient entered the hospital with a clinical diagnosis of probable pancreatic growth from a diagnostic laboratory; a very small hernia was found in the middle line, about midway between the umbilicus and the sternum; this hernia disappeared when the patient lay down, but the abnormal opening was readily felt, when the abdominal recti muscles were made tense by the patient's lifting his head.

This man's outstanding symptom was pain, more or less constant, increased by food or by exercise and I am pleased to report entire relief from the operation.

The other patients came into the hospital without previous examination and the hernias were readily found; operation relieved them. There was nothing unusual to remark about these cases, except that one of these men had two hernias, both small, in the median line, the lower one about one inch above the umbilicus and the other one about one inch above this. It is not unusual to find two hernias, but the lower one is practically always at the upper border of the umbilical opening, making really an umbilical hernia with an epigastric one above.

I have not included in this paper an account of diseases of the recti muscle, as they are not properly epigastric hernia.

I have purposely refrained from argument as to whether the herniated fat contained between layers of peritoneum forming the falsiform ligament is a true hernia or not; it seems sufficient to me to know that it is a condition with certain clinical symptoms requiring relief.

I believe that these hernias are more frequent than we think and that, in every case of abdominal distress, it will be well to examine the patient standing, or at least to have him raise the head from the examining table, and pass the finger lightly along the middle line.

The treatment is operation; the technique of the operation is simple; the operation is without extraordinary risk and the results are equally gratifying to patient and surgeon.

DISCUSSION

Chas. K. Beck: This afternoon I had the privilege of seeing a patient with epigastric hernia. The protrusion in this case is about the size of a walnut and contains a small knuckle of small

intestine. You can feel the "gurgle" and hear it distinctly as the tumor is reduced, and then you can feel the ring about an inch and a half above the umbilicus. The hernia is of recent origin and there seem to be no adhesions. The patient is a man fifty-one years of age and rather stout. He has had the hernia only a few weeks so far as he knows. I saw him for the first time this afternoon, and as soon as he gets his affairs in shape to have an operation performed, I expect to operate upon him.

Irvin Abell: I have seen and operated upon six or eight cases of epigastric hernia, and these in the main have borne out the physical characteristics which have been described by the essayist. I have seen none, however, that presented the symptom of diarrhea. The sac has invariably been covered with a very thick layer of fat reminding one very much of the type of sac seen in femoral hernia. In all my cases the hernia was small. In operating upon these herniae, I have invariably used the so-called Mayo method, making a traverse incision and overlapping the fascia.

I rose particularly to speak of two cases, one seen for the first time this afternoon. As to the origin of these herniae: most of the patients give the history of gradual development. In only two instances coming under my observation did the patient state that the hernia had existed from childhood. One man gave his own history of causation, stating that he had attended a fish fry—this was in the days when fish fries were accompanied by some liquid medium in which the fish were supposed to swim. The man stated that he had partaken liberally of fish and also the liquid medium to which reference has been made. Four or five days later he noted tenderness in the epigastrium. At the end of ten days he developed an abscess in the epigastrium slightly to the left of the midline between the ensiform and umbilicus. Finally this abscess was opened by his family physician and a fish bone one and a half inches long escaped with the pus. He subsequently had an epigastric hernia, a part of the stomach being contained in the sac.

The second case, which is of special interest to me, is one seen for the first time today. The patient is a woman from the mountains of Kentucky, thirty-eight years of age, the mother of eleven children, weighing about 185 pounds, states that following the birth of her first child she noticed a small protrusion in the epigastrium about midway between the xiphoid cartilage and the umbilicus. With each subsequent pregnancy this has increased in size. During the last four years it has been impossible to completely reduce the tumor. While lying on her side the protrusion is quite marked, and when standing it is very prominent. While lying on

her back the ring can be easily outlined, being approximately three inches in its transverse diameter and two inches in diameter from above downward. Judging from the palpation and percussion the hernia not only contains a large amount of omentum but in addition part of the transverse colon. I would also judge from the symptoms of discomfort which she describes as occurring after eating that it must contain a portion of the stomach. With the woman standing the tumor is approximately six and a half to seven inches transversely and six inches from above downward. It projects considerably from the line of the abdomen, so much so that I think it is going to be a difficult matter to close it satisfactorily. I do not believe it will be possible to close the opening by overlapping from side to side, and if overlapped from above downward in a woman of this size, great tension is apt to be produced.

FIFTY-CENT PIECE IN THE ESOPHAGUS FOR THREE MONTHS. REMOVAL THROUGH MOUTH.*

By S. SHELTON WATKINS, Louisville.

On April 22, 1921, R. J., a boy 12 years of age and somewhat undersized, was brought to my office with the following history: On January 9, 1921, while playing with a fifty-cent piece he accidentally swallowed it. For a few minutes he suffered from severe choking and pain in the throat and chest, but these symptoms soon passed off and after that for a while he felt quite comfortable. The parents were advised that after a short time the coin would be passed in the stool, but, as it was not detected, they finally concluded that either the boy had not really swallowed it or its passage had escaped their notice. From the beginning, however, he complained of pain in the back on swallowing, especially when he had eaten meat and any semi-solid foods. At times he could take liquids without pain but this was exceptional. He did not vomit either food or blood, and in the opinion of the parents, had lost little, if any, weight. No improvement having taken place and the pain gradually becoming worse, on April 20th, the boy was taken to see in consultation Dr. Fred Reardon, Bowling Green, who with the fluoroscope discovered the fifty-cent piece in the esophagus.

When the patient came to see me on April 22nd, a second fluoroscopic examination was made and an object the size of a fifty-cent piece was observed in the midline of the chest on a level with the junction of the second

and third ribs and sternum. An X-ray gave a shadow of a similar size and in the same location. The boy's height was four feet 6 $\frac{1}{4}$ inches and his weight 62 $\frac{1}{2}$ pounds. Otherwise the physical examination had no bearing upon the case and consequently the details will be omitted.

Treatment: On April 23rd, an attempt was made to remove the coin. This was unsuccessful, partly owing to the fact that the



patient took the ether badly so that the examination was interrupted three times and, partly because we were hampered by an excess of secretion from the esophageal and salivary glands, an abundant muco-purulent discharge and a rather free bleeding from granulation tissue around the foreign body. A preliminary hypodermic injection of atropine sulphate (gr. 1-200) had been given twenty minutes before starting the anesthetic but it had no appreciable effect upon the secretions. The attempt was abandoned after thirty minutes, a time limit which is essential in such operations, even in older children, if a dangerous degree of shock is to be guarded against. On April 28, a second trial was made. The usual preparations for ether anesthesia were carried out but in addition two injections of atropine sulphate (gr. 1-200) instead of one were given, the first dose two hours and the second twenty minutes before beginning the anesthetic. The adult size of a Jackson esophageal speculum

was chosen, because at the first examination the child's size had been found to be too short. There was very little secretion in the esophagus and practically no saliva. At a point 23 cm. from the upper central incisors a piece of blackened metal, the size of a fifty-cent piece, was found lying in the frontal plane. It was surrounded by a mass of granulation tissue and a fair quantity of muco-purulent discharge. After removal of the discharge together with a small amount of blood and secretion by means of a suction pump, the coin was grasped with a Jackson's esophageal forcep and loosened in its bed by rotation. After this it was readily drawn into the mouth of the esophageal speculum and removed. The operation lasted ten minutes. Convalescence proceeded without any set-back. For thirty-six hours the patient was given fluids by rectum but nothing by mouth. On June 3, the father writes, "The boy is doing fine."

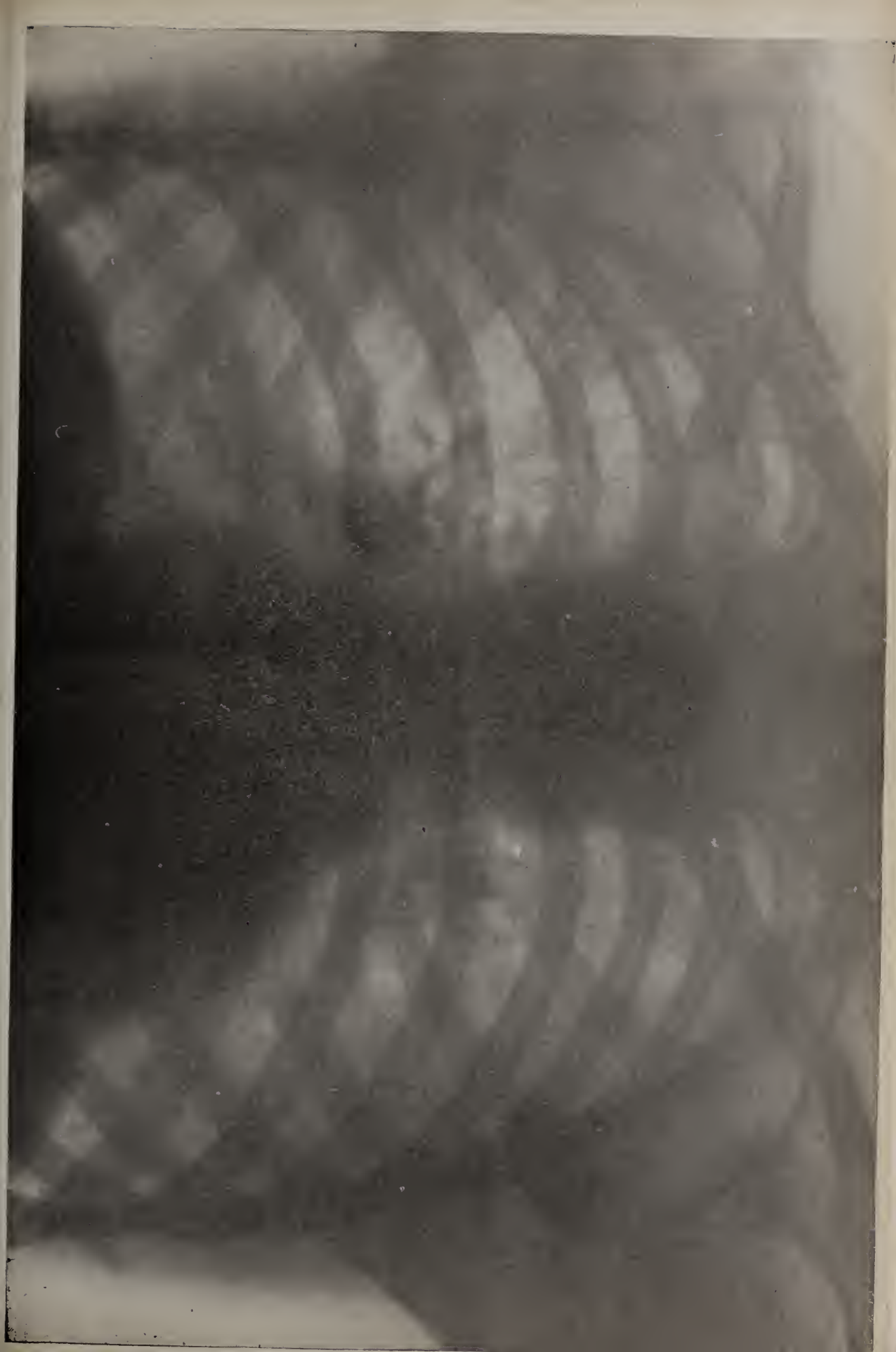
COMMENT.

(1) So far as I have been able to find in the literature this is the largest foreign body that has been removed from so young a patient and after so long a lodgment.

(2) The case has confirmed me in my belief in the rule, advocated by Dr. Jackson, that in children esophageal examinations should never be prolonged over thirty minutes. In our efforts to relieve such patients we should never endanger life, and it is far better to stop in time before the patient is severely shocked. These cases are sometimes very difficult and two or more efforts, after an interval of five or seven days, may be necessary before success is attained.

(3) Atropine should be given hypodermically in doses sufficient to diminish the secretions and to make the field of operation clear.

(4) In this case, at the request of the patient, a general anesthetic was used, but in suitable cases, whenever the patient has sufficient grit and consents to cooperate, these extractions can be carried out without any anesthetic, either general or local, and with surprisingly little pain or discomfort. The manipulations in themselves necessarily are productive of a good deal of shock and, other things being equal, the elimination of the anesthetic will prove of great advantage. Nevertheless, we must always remember that we are dealing with human beings and not with theories and, that in some, perhaps the majority, of our patients, the mental shock without an anesthetic may be worse than the physical shock produced by it.



OCCUPATIONAL PAIN: TUBERCULOSIS; CASE REPORT.*

By JOHN J. MOREN, Louisville.

A young man came to see me, one of those typical so-called "musical temperament" individuals, high strung, etc., who had been playing the piano for twelve or fifteen years. The boy had pain in his left arm. He gave the history of having had occupational pains, so diagnosed by physicians in New York and various other places where he had played. They had dismissed the case as occupational pain and attributed it to over-exertion in playing the piano.

He developed a radiating pain in his left arm, but it always started in the middle of the left anterior chest. I told him I regarded it as an occupational pain depending on over-use of the arm in playing the piano. His wife, who seemed to be a very shrewd little woman, was determined to have a roentgen-ray examination made. I told her I could not recommend the x-ray, that I saw no reason in the world why she should be put to that expense. She replied that it made no difference, that they came to Louisville to have a complete examination made, and insisted upon going to the x-ray laboratory.

A prominent radiographer made the examination which showed a cavity in the left lung, probably an old process which had healed, and in appearance was typically tuberculous. There was also an active tuberculous process in the right lung. The man had no elevation of temperature, no shortness of breath, and no other significant symptoms so far as the neurological examination was concerned. However, I listened over his chest and thought the excursions of the right lung were not quite as good as the left; but I could hear nothing particularly abnormal so far as could be determined.

I am satisfied now that this boy had a tuberculous process in his left lung, and possibly adhesions started the pain in his left chest which radiated downward into the left arm. I believe that would account for all his pain.

According to the history the disease in this case was of ten years duration. Hereafter when an individual suggests roentgen-ray examination to me, I shall interpose no objection whether I think he needs it or not.

DISCUSSION:

J. G. Sherrill: A young man came to me recently, he had served in the army, sent by his attending physician out in the state, for a complete examination. He was claiming some compensation from the government for a rheumatic affection. He showed some depression in his cheeks and evident loss of flesh which was not marked; he claimed not to have had any fever. There was no evidence of any particular lesion about the joints although some of the smaller articulations were swollen and slightly tender.

Examination of his chest revealed dullness downward to the fourth interspace on the left and to the third interspace on the right side. I investigated his chest very carefully and failed to find any other adventitious signs. There was no prolonged expiration at either apex; there were no rales or anything else to attract attention. There was slight depression under the clavicles and also over the spine of the scapula on each side. I could find nothing else abnormal. From the dullness alone I concluded he had tuberculosis.

The patient was sent to a prominent roentgenologist without any report of my findings, and he confirmed the diagnosis, the x-ray showing that there was a clouding of the lung. He gave it as his opinion that the man had tuberculosis involving the upper portion of both lungs. He reported greater involvement on the right than the left side.

The question now arose whether this was an old tuberculous process or an acute tuberculosis which had just commenced. Frankly I am unable to state which the condition is, but that is a very important point to this young man, because if it is an old process which developed while he was in government service he should receive compensation for it. If the tuberculous process is acute, developing since his discharge from government service, of course he is not entitled to compensation.

The most interesting point is that the roentgen-ray confirmed my physical findings. If this has been true in other cases, we should be very cautious in our examinations particularly of the lung. We all make mistakes, but I do not believe many are made by giving the patient a thorough and complete examination, except occasionally in acute cases with slight involvement of the lung tissue.

In the case I have mentioned there was some retraction of the wall on inspiration between the third and fourth ribs, which would tend to confirm the opinion that the process is not acute.

S. G. Dabney: While I do not care to discuss the details of the case reported by Dr. Moren, I sometimes read articles on general medicine and have noted many interest-

*Clinical Report before the Louisville Medico-Chirurgical Society.

ing things. A recent author in speaking of the x-ray says that nobody needs to see pictures in the dead room in cases of tuberculosis more than the roentgenologist. Prof. Osler once said if the roentgenologist could see the actual post-mortem findings after he had made his report it would be a revelation to him. I have often wondered if the x-ray pictures in cases of this kind had been borne out by autopsy findings.

John W. Moore: We see not a few of these old cases of pulmonary tuberculosis at the Louisville city hospital, particularly on the colored side. The chest wall is often found retracted on the affected side without any evidence of an acute lesion. In many instances there are no rales unless the patient is made to cough. When you are in doubt about rales have the patient take a deep breath, expire and then cough; oftentimes that will bring out rales that ordinarily would not be heard.

I recall one or two cases where there was military tuberculosis of the healing type. No rales could be found in the chest. Even at the autopsy table we thought we were not dealing with tuberculosis. The lungs were markedly emphysematous, many small nodules could be felt, but none seen. I thought clinically it was an old bronchitis. Microscopical sections in the cases showed the presence of healing military tuberculosis.

Remote Results of Operative Treatment of Gastric Ulcer.—Denechau reviews 28 operative cases of gastric ulcer with an interval since up to fourteen years. This supplements his previous series of 95 cases published in 1907. In the gastro-enterostomy cases the outcome was bad in 11 of 100 patients reexamined, but only 1 died eight years later from cancer, and indurated ulcer did not develop in any case. In 51 cases with interval of from four to twelve years, the outcome has been most excellent in 10. He draws the conclusion from this long study that the future is for excision; this alone wards off cancer, but the many successful cases of gastro-enterostomy alone, especially for stenosis, show that much can be anticipated with this, especially with continued surveillance and careful diet.

Alkapton and Acetone.—Katsch tabulates the metabolic findings and those of various tests in a case of alkaptonuria in a boy who has been under observation and the subject of research for several years. The findings confirm that the alkaptonuria subsides during the acidosis induced by withdrawal of carbohydrates. It subsides as ketonuria appears. When the acidosis supplants the alkaptonuria, the amount of acetone bodies eliminated is larger than can be explained by the transformation of the aromatic albumin complexes.

NEWS ITEMS AND COMMENTS

The Henderson Radium Institute, Mosely Hospital, Henderson, Kentucky, announces that they have sufficient radium available for treatment of all suitable cases and have a radium rental service to physicians. The officers of the Institute are J. C. Moseley, M. D., president; M. H. Yeaman, M. D., vice president, and M. Y. Marshall, M. D., radiologist.

Congenital Dorsal Scoliosis Due to Spinal Defect.—In the case cited by Carroll L. Storey and Carl C. Birkelo, Detroit, (*Jour. A. M. A.*, *Feb.* 19, 1921) the spinous processes of the sixth, seventh and eighth dorsal vertebra were rather sharply displaced to the right, the greatest deviation amounting to one-half inch. No secondary curves appeared above or below. The flexibility of the spine was somewhat limited in the middorsal region, and normal elsewhere. Twelve ribs could be palpated on the right side, twelve on the left. The upper left rib appeared, however, to be attached to the seventh cervical vertebra. Only eleven dorsal spinous processes were palpable. Stereoscopic plates of the spine revealed two points of abnormality, namely, in the seventh cervical and the eighth dorsal vertebrae. The seventh cervical vertebra had a fully developed rib on the left side and a short rudimentary rib on the right. The eighth dorsal vertebra was rudimentary and consisted of a small triangular body wedged in between the seventh and ninth vertebrae on the right side with a unilaterally developed pedicle, transverse and spinous process in no respect different from the corresponding parts on the other vertebrae above and below it. A fully developed rib articulated with it on the right side, and there was no attempt at a corresponding rib on the left side. Thus, there were twelve fully developed ribs on each side, but the first rib on the left was cervical, and counting the rudiment from the seventh cervical vertebra on the right, there were thirteen ribs on that side.

Estimation of Bile Acids in Bile.—A method for the estimation of the nitrogen of bile acids of the taurine and the glycocholic series in bile is described by Schmidt and Dart. It is based on the fact that on hydrolysis with sodium hydroxide the bile acids are split, setting free taurine and glycocholic which react quantitatively with nitric acid. The taurine nitrogen can be estimated from the total sulfur content of protein-free bile. The difference between the amino nitrogen resulting from the splitting of the bile acids, and the taurine nitrogen, less 3 per cent, gives the glycocholic nitrogen.

Kentucky Medical Journal

PUBLISHED MONTHLY BY
THE KENTUCKY MEDICAL ASSOCIATION
Incorporated

Editorial and Business Office, Cor. State and Twelfth Sts.

Entered as second class matter October 22, 1906 at the Postoffice at Bowling Green, Ky., under act of Congress, March 3, 1879.

Subscription Price\$2.00
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Next Meeting Seelbach Hotel

Louisville, September 19, 20, 21, 22, 1921

COUNTY SOCIETY REPORTS

Carlisle—The Carlisle County Medical Society met in Cunningham, with Dr. R. C. Burrow, president in the chair, at 11 A. M., June 7th, 1921.

The minutes of the previous meeting were read and approved.

Motion carried that all visiting physicians be made honorary members of our society and that they be extended the courtesies of same and take part in the discussions of the various papers.

First on program was a clinic by Dr. C. E. Percell, of Paducah. He used the Schlender method in removing tonsils. His clinic was very interesting and instructive.

At 2 P. M., the society reconvened, and by request of the President, Dr. Goodlow demonstrated his bronchoscope, an instrument of his own design. His explanation was interesting and instructive.

T. J. Marshall read a very interesting paper on "Rheumatism". It was out of the ordinary and dealt with the focal infections. His paper brought out an interesting discussion.

W. Z. Jackson failed to have his paper and the subject was passed.

D. P. Robertson read a very interesting paper on "Questioning the Mother."

We had with us, Drs. Flint Bondurant and J. S. Johnson, of Cairo, Ill.; Drs. C. E. Percell and H. H. Dooley, of Paducah; Dr. Goodlow, of Chattanooga, Tenn.; Drs. D. E. Burrow and R. D. Harper, of Lovelaceville, and B. B. Henson, of New York City.

Members present were, Drs. J. F. Dunn, R. T. Hocker, W. E. Jackson, H. A. Gilliam, Wm. L. Mosby, H. T. Crouch, T. J. Marshall, R. C. Burrow, D. P. Roberson and G. W. Payne.

The society extended a vote of thanks to Dr. Burrow and his daughters for the elaborate dinner served.

The society adjourned to have an all-day session with Dr. Gilliam the first Tuesday in September.

GEO. W. PAYNE, Secretary.

Franklin—The Franklin County Medical Society held its monthly meeting Saturday, July 9th, at 4 P. M., in the office of Dr. Roemele, with the president, Dr. Roemele, in the chair.

Present: Drs. Roemele, Garrett, Fish, Patterson, Stewart, Minish, Heilman, Coleman, Irman and Mastin; Dentists, Drs. Posey, Hall and Smith.

J. H. Evans, the new Reformatory physician, made application and was admitted to membership in the society.

The society was honored by having as guests, C. G. Hoffman, councilor of the fifth district;

Barnett Owen, Raymond Grant and Dr. Enfield, all of Louisville.

C. G. Hoffman gave a short and practical talk or best means for county societies to make their meetings attractive and increase attendance.

Raymond Grant read a most interesting paper on Focal Infection. Discussed by Barnett Owen and Dr. Enfield, also by all the dentists and many of the members. Judging by the amount of interesting discussion it brought forth, it seemed the subject was well-timed.

Refreshments were served and a social hour enjoyed by all present.

Adjourned to meet in October.

F. W. MASTIN, Secretary.

Grant—At the regular meeting of the Grant County Medical Society, the following officers were elected: C. A. Eckler, President; W. P. Forman, Vice President; C. M. Eckler, Secretary and Treasurer; A. D. Blaine, J. W. Abernathy, Harry F. Mann, Board of Censors; N. H. Ellis, Delegate.

C. M. ECKLER, Secretary.

Russell—The Russell County Medical Society held its regular meeting at Russell Springs, July 13th, in connection with the Teachers Institute, which was in session. Dr. C. B. Cobert, of the State Board of Health, and Miss Sudeker and Miss Cochran, Public Health Nurses, who are making a health campaign in Russell, Drs. Tabor and Scholl also made talks on Public Health and Sanitation.

J. B. SCHOLL, Secretary.

Multiple Serositis.—Fifteen such cases were found by Reid, among 3900 necropsy reports making the incidence of this disease just under 4 per cent. The condition was fully appreciated only at the necropsy. In two cases, however, the clinicians discovered an adhesive pericarditis, and in a third case the diagnosis was "chronic fibrous peritonitis." Physical examination was normal in nine cases. Of the remaining six, five presented definite ascites which was evident clinically, and one showed slight ascites of the necropsy. In these six cases with ascites, the peripneumonitis and perisplenitis were well marked, but in four cases the heart showed endocardial or myocardial lesions sufficient to be a factor in the production of the abdominal effusion. In seven instances the chronic multiple serositis (pericarditis, pleuritis, perihepatitis and perisplenitis) was the primary finding, and in the remaining eight it was listed as a secondary lesion. This group of cases was characterized by pathologic evidence of a previous inflammation of the pleura, pericardium and peritoneum.

BOOK REVIEWS

The Allen Treatment of Diabetes With Progressive Diet Lists.—By Lewis W. Hill, M. D., and Rena S. Eckman, Dietitian at the Massachusetts General Hospital 1911-1916. With an Introduction by Richard C. Cabot, M. D. Fourth Edition. W. M. Leonard, Publishers, Boston.

Physicians agree that Dr. Frederick M. Allen, by his work at Harvard University and later at the Rockefeller Institute, has contributed most toward bringing about the improvement in the treatment of diabetes.

Statistics of the Massachusetts General Hospital show that the mortality from Diabetes prior to 1914 was over 28 per cent., and that since The Allen Treatment was discovered it has become less than 6 per cent.

"There is scarcely a disease in which good or bad treatment is so important as in diabetes; there is no disease in which there is so much chance for the patient to do his part and to help himself by intelligent cooperation; there is no disease which gives such reward to faithful and painstaking effort on the part of the doctor and patient."—Dr. Hill, Fourth Edition.

Pulmonary Tuberculosis: With Case Histories.—By Edward O. Otis, A. B., M. D. A new enlarged and practically rewritten edition of Dr. Otis' book, the first edition of which appeared in 1917, published by W. M. Leonard, of Boston, and one of the well-known "Case History Series." This is not Dr. Otis' popular book "Tuberculosis," but a medical work written in plain, simple, understandable language.

Two for One. In this book Dr. Otis has combined with rare skill and judgement the material that the physician and medical student on the one hand and every patient and tuberculosis worker on the other should know about tuberculosis. It is a Medical Book for Lay Readers. Few medical books appeal to or can be so readily used by the lay reader.

High Lights. Among the many topics dealt with in a readable, accurate manner are the following: Anatomy and Physiology, Pathology and Bacteriology, History of Tuberculosis, Diagnosis, Prognosis, Treatment, Tuberculosis in Children, Climate, Prophylaxis, After Care and Marriage, Case Histories, etc., etc.

Every physician, tuberculosis patient, and tuberculosis worker should have it.

American Red Cross Work Among the French People.—By Fisher Ames, Jr. The scope of the Civilian Relief Work of the Red Cross is perhaps not fully appreciated. This volume indicates what was done in this line in France alone. The story is an interesting one and the impression which it conveys of the tremendous activities

of the Red Cross in this field of endeavor will come as a great surprise to many people.

This volume concludes the splendid series issued under the auspices of the Red Cross, to give the American people an adequate idea of the wonderful work which their dollars did in France through the Red Cross Organization. The titles already issued are: *The American Red Cross in the War*, *The Red Cross in Italy*, *With the Doughboy in France*, *The Passing Legions*.

The Macmillan Company, Publishers, New York. Price \$2.

The Third Great Plague: A Discussion of Syphilis for Every-Day People.—By John M. Stokes, A. B., M. D., The Mayo Clinic, Rochester, Minn. 204 pages, illustrated. W. B. Saunders Company Philadelphia, Publishers. Price \$2.25.

Public hygiene has practically eradicated tuberculosis, yellow fever, and malaria from our civilization. The third great plague—syphilis—is also preventable and curable in direct proportion to the spread of knowledge of the weapons against it. Dr. Stokes discusses it purely as a problem of public health—as a disease than can be prevented, that usually can be cured. The book is not “deep” reading. It is written “for every-day people,” and gives the chief facts concerning infection prophylaxis, progress of the disease, the various methods of diagnosis and treatment in such form that they will readily become matters of common knowledge. It has a message of vital importance for the soldier or sailor, and for all those interested in welfare work.

The Principles of Immunology.—By Howard T. Karsner, Professor of Pathology, Western Reserve University, Cleveland, and Enrique E. Ecker, Ph. D., Instructor in Immunology, Western Reserve University, Cleveland. Illustrated, J. B. Lippincott Company, Publishers, Philadelphia and London.

This book has been prepared in the hope that a concise statement of the facts and more important hypotheses concerning resistance to infection may serve to provide a clear understanding of a subject of the utmost importance in modern diagnosis and treatment. Designed primarily for students of medicine and for those practitioners whose duties have made it impossible to digest a large mass of publications on the subject, the scope of the book is restricted to fundamental principles. The plan throughout is to present on an experimental basis the demonstrated facts and to supplement these with brief discussions of the practical and theoretical bearing of the phenomena upon resistance and disease in man. A few illustrations have been inserted, but is must be recognized that technical details can only be fully comprehended on the basis of actual

work with the methods. The usual diagrams of the side-chain theory have been omitted because of the belief that they serve to confuse rather than clarify the conception of processes whose fundamental basis lies in the field of physical chemistry. Certain material concerning the practical application of immunology to the prevention and cure of disease has been collected in three appendices. These have been added in order to explain the basis of the practical methods rather than as an exact guide in their application.

The American Year Book of Anesthesia and Analgesia.—By F. H. McMechan, Editor Pharmacology-Physio-Pathology of Anesthesia and Analgesia are new chapters that have been added as well as all the progress in these subjects that are of interest to the anesthetist, dentist, research worker and surgeon. The book is well illustrated and has as its contributors such authorities as Donald Guchree, F. A. Williams, J. H. Cotton, Palu Cassidy.

Keen's Surgery Volume VII.—By Surgical experts. Edited by W. W. Keen, M. D., L. L. D., Hon. F. R. C. S., Eng., and Edin., Emeritus Professor of the Principles of Surgery and Clinical Surgery, Jefferson Medical College, Philadelphia. Octavo of 855 pages, with 359 illustrations, 17 of them in colors Philadelphia and London: W. B. Saunders Company. 1921.

A record of the remarkable surgical advances developed during the war, bringing them into organized form, available for the surgery of peace; together with every worthwhile achievement in surgery since the war.

Two octavos, totalling 1800 pages, with 996 illustrations, 29 in colors—a series of monographs of new surgery by an assemblage of surgical authority perhaps never equalled in any one work. The authors are surgical experts, selected from Europe as well as from America.

A separate Desk Index Volume to the entire eight volumes, making available every item on any subject discussed in the 8900 pages, comprising the complete work. This Index Volume is free to those who buy Volumes VII and VIII.

Treatment of Stiff Metacarpophalangeal Joints.—The principle of the treatment discussed by Dickson is that the metacarpophalangeal joints are gradually flexed with plaster; then, by means of the “retaining splint,” this flexion is maintained between the massage treatments until there is full voluntary flexion and no tendency to relapse. The ability to flex the joints voluntarily and retain the flexion is the indication for the removal of the splint. If, with freedom, there is any tendency towards limitation of the flexion obtained, the splint must be reapplied for further period.

KENTUCKY MEDICAL JOURNAL

BEING THE JOURNAL OF THE KENTUCKY STATE MEDICAL ASSOCIATION

Published Under the Auspices of the Council

VOL. XIX.



BOWLING GREEN, KY., SEPTEMBER, 1921

No. 9

EDITORIAL

DR. J. A. STUCKY.

Dr. J. A. Stucky was born September 6th, 1856, Louisville, Kentucky, and was the son of Harry Stucky and Sallie K. Sweeney Stucky. He graduated from the Medical Department of Kentucky University, 1878, since which time he has made his home in Lexington, Kentucky. During his practice in this city, he has been actively engaged in all public health work, and in 1912, was able to interest the Government in the trachoma problem which existed in Eastern Kentucky, since which time a number of Government Hospitals have been established for the treatment of this disease. Since the taking over of this work by the Government, Dr. Stucky has interested himself in other diseases of the head and throat, holding clinics at different times in the mountains of Kentucky. After the beginning of the late world war he was unable to hold any more clinics in the mountains, but has seen and treated numbers of the mountain people who have found the means to come to Lexington. He has taken an active interest in the Public Health and Associated Charity Work in Lexington and is now head of the Department for the Eye, Ear, Nose and Throat.

In his public work he has been President of the American Academy Ophthalmology and Oto-Laryngology, 1907; American Laryngological, Rhinological and Otological Society, 1903; Secretary Laryngology and Otology, 1899-1900; President of State Medical Association, Kentucky Midland Medical Society, Fayette County Medical Society, and Mississippi Valley Medical Society. He is at present President of the Kentucky State Medical Society, and Chairman of the Section of Ophthalmology and Oto-Laryngology of the American Medical Association for 1922.

THE ANNUAL MEETING AT LOUISVILLE.

Physicians and their wives are expressing especial pleasure that the Annual Meeting of the Kentucky State Medical Association is to be held in Louisville this year. Louisville is the natural mecca of Kentucky doctors. Most of them graduated here. All of them have professional and social affiliations that make a week's stay a pleasant event. The program of the State Meeting this year is so full of good things that every one will return home not only rested from the vacation, but mentally refreshed and a better doctor. Practically all of the papers are already in the hands of the Secretary, and they maintain the high standard of excellency of recent years. In fact, they bring modern scientific medicine right up to date, and no practitioner can afford to miss them.

All of the sessions will be at the Seelbach Hotel. The House of Delegates meets on the 19th, and on that day there will be special sessions of the various specialists in medicine which are referred to elsewhere in this issue in the Report of the Council.

The Scientific Session opens on the morning of September 20th, and continues through three full days, Tuesday, Wednesday and Thursday. As we have done for the last three years, many of the best papers have been reserved for the last day, and members are urged to arrange to stay in Louisville until late in the afternoon of Thursday.

On Tuesday evening, Dr. Stuart McGuire, of Richmond, Virginia, will deliver the annual oration. Dr. McGuire needs no introduction to the medical profession of any southern State. Like his distinguished father who was the Surgeon General of the Confederacy, he is typical of the highest culture in American medicine, and is one of the leading medical statesman of the country.

The annual orations by Drs. S. S. Watkins

and P. D. Gillin will be worthy of the distinguished honor conferred upon these two gentlemen.

In other pages of this issue the business of the Association is covered in great detail. The report of the treasurer and auditor explain how every cent of its money has been expended. It is of importance that every member familiarize himself with this part of the report, and that the delegates read it carefully so they will be prepared for such action as it may demand.

The Report of the Council is especially illuminating. No physician who is interested in the welfare of his profession or his State can afford to omit a single paragraph, as each of them will require thought and constructive action by the House of Delegates.

Credit for the excellency of the program is due to Drs. W. Owsley Grant and J. A. Stucky.

We trust that every physician in Kentucky will help in making this the largest, as we are sure it will be the best, session we have ever held.

SCIENTIFIC EDITORIALS

OBSERVATIONS ON THE APPENDIX CECI VERMIFORMIS: WITH ESPE- CIAL REFERENCE TO THE RET- ROCECAL TYPE.

Many modern authors date the history of appendiceal pathology from 1886, when Reginald Fitz of Boston, declared "that it is the duty of every physician to be mindful that, for all practical purposes, perityphilitis, perityphilitic tumor and perityphilitic abscess, mean inflammation of the vermiform appendix," the fact being ignored that typical appendicitis had been accurately described more than one hundred years prior thereto.

As a matter of historical interest the first record of pelvic abscess due to appendiceal inflammation, reported by Mestivier, in 1759, is reproduced in part. A male aged forty-five had a tumor in the right umbilical region; fluctuation could be detected, and a pint of pus was evacuated by incision; the wound healed rapidly, but the patient died shortly afterward. Autopsy showed the cecum covered with gangrenous patches; the appendix ceci vermiformis contained a large markedly corroded pin which had evidently been there concealed for a long time; and it was undoubtedly this which had irritated the different coats of which the organ is composed, thus giving rise to the patient's symptoms and finally causing death. The erroneous idea that append-

iceal abscess invariably owes its origin to the presence of foreign bodies has long since been refuted, but there are still authors who still adhere to this belief.

It was originally assumed that normally the appendix ceci vermiformis had a definitely fixed anatomic situs and standard size; but investigations have demonstrated wide variations in both its extent and position. Discrepancies in the size, shape and location of the organ noted by early anatomists were regarded merely as curiosities and little comment was thereby excited. So far as can be ascertained, the shortest appendix noted in the human being was described by Huntington (5mm), the longest by Grauer (33 cm.), the average length being 8.3 cm. or about $3\frac{1}{4}$ inches.

It is of surgical importance to remember that there is no normal standard for location and size of the appendix. These facts may be understood and appreciated when the embryonic development of this portion of the intestinal canal is considered. A recent text book author states that the appendiceal wall is composed of tissues which correspond to those of the remainder of the intestine; that its lumen may be stretched into cylindrical form, but in general it collapses into a narrow space which is found "Y" shaped on cross section, one limb of the "Y" reaching toward the mesenteric attachment; the mucosa contains crypts, but has no villi; it is peculiarly rich in nodules of lymphoid tissue; and, finally, while the appendix usually extends from the cecum inward toward the pelvic brim, great variations are found in its position, size, mesenteric attachment, and its relation to the peritoneal folds.

From a purely surgical standpoint the following facts must be constantly borne in mind:

- (1) That in extent the appendix may be long, short, large or small:
- (2) That it may be inverted and coiled within the cecal lumen: the so-called appendix absentia or obliterans:
- (3) That it may be found to exist merely as an attenuated cord situated beneath the cecal serosa:
- (4) That the proximal extremity may be carried "far afield" by abnormal mesenteric attachment:
- (5) That through developmental error, faulty rotation or descent the cecum with appendix and other viscera may be found anywhere in the abdominal cavity "from the liver to the pelvic floor."
- (6) That, finally, the location of the ap-

pendix may be entirely retrocecal and extra-peritoneal.

According to Kelly, the direction and course of the appendix is regulated by its length, consistency, and mobility afforded by its mesentery; thus, the tip may point in various directions. The relative frequency of these directions has been stated as:

- (1) Horizontal toward the promontory,
or pointing laterally 32%
- (2) Oblique toward the spleen.....10%
- (3) Ascending 34%
- (4) Descending 24%

Expressed in other words the appendix in any case may normally point:

- (1) Into the pelvis:
- (2) Along the iliac vessels:
- (3) To the promontory of the sacrum:
- (4) Behind the cecum:
- (5) Under the ileum:
- (6) Lateral to the cecum:
- (7) Into the iliac fossa:
- (8) Among the coils of the small intestine:
- (9) Mesial to cecum over the ileum.

In perhaps the larger portion of cases (40%) the appendix is found "tucked away behind the ileocecal junction."

It is estimated that the appendix occupies a retrocecal position in approximately thirty-three per cent of instances, and that is in accord with my observation. During the last twelve months the writer has performed eight appendicectomies for acute and chronic appendiceal pathology in which the appendix was retrocecal, and in half of these the organ was rendered extra-peritoneal by anomalous mesenteric formation with adhesions. In the latter type (four cases) extirpation of the diseased appendix could easily have been accomplished without opening the peritoneum had it been possible to determine the exact situation prior to the operation. However, there are no pathognomonic signs to influence judgment in appendiceal localization in this particular type since displacement is considerable.

The chief etiologic factors contributing to the production and maintenance of retrocecal position of the appendix have been briefly summarized as:

- (1) The influence of peritoneal adhesions established during descent of the cecum from its subhepatic position to the iliac fossa:
- (2) The inherent curve of the fetal pouch:
- (3) The unequal development of the pouch:

Most important, in the opinion of the writer, is anomalous mesenteric formation during fetal development with persistence of adhesions.

"The appendix may be primarily adherent to either the parietal peritoneum or to the posterior visceral peritoneum of the cecum and colon and, after fusion of the parietal and visceral peritoneum occurs, it becomes hermetically sealed." Retrocecal position of the appendix is uncommon where cecal fusion has occurred in the normal manner.

In attempting to determine the exact position of an aberrant appendix the following diagnostic points have been suggested as important:

- (1) Careful survey of the cecum, with the embryology thereof in mind:
- (2) Noting the relative size and position of the terminal sacculi:
- (3) Its topographical peritoneal relations:
- (4) The degree of descent:
- (5) Its position relative to fixed landmarks:
- (6) Associated conditions both pathological and developmental:
- (7) The direction of the terminal portion of the longitudinal bands:
- (8) Careful palpation.

The removal of the pathologic retrocecal appendix necessarily requires modification of technical procedure and greater surgical skill than performance of the classical appendectomy. The technique of the latter operation has been practically standardized. If the extra-peritoneal location of the offending organ could be determined prior to operation, the technique of exposure and removal would be greatly simplified; but, as already stated, unfortunately this is not always feasible, and extirpation must be accomplished through the classical right rectus incision.

In removal of the retrocecal appendix it has been recommended that the cecum and so much of the colon as necessary be first mobilized to afford adequate exposure, then to liberate and deliver the diseased organ, the operation being completed in the usual manner. The procedure is simple and with exercise of proper care may be made practically bloodless. This is essentially the method which has been described by Vosburg, Shaw and others. It is superior to the plan of Cullen in which exposure is secured by introducing forceps through the meso-appendix followed by a series of tapes for making traction.

In operating for appendicitis it has been my practice in boys, men, most girls and some women to employ the McBurney gridiron incision which can be enlarged if necessary by incising the posterior sheath of the rectus and pulling the muscle toward the midline. After opening the peritoneum the finger is in-

serted along the right side of the abdominal wall downward to the cecum which is then elevated and brought into view. By this plan the appendix is easily located by following the longitudinal band even if the organ is retrocecal. If possible the appendix is ligated at its base and inverted with pursestring suture which leaves no exposed ray surface. In the event there is any raw surface after the retrocecal appendix is dissected free, it should be closed by immediate suture.

CHAS. A. VANCE.

NOTE: In preparation of this editorial the following books and medical journal articles have been consulted and material excerpted therefrom, for which it is desired full credit be extended.

Kelly: The Vermiform Appendix, etc., 1905, Saunders Co., Philadelphia.

Shaw: *Annals of Surgery*, June, 1916.

Neill: *Journal of the A. M. A.*, January 23rd, 1915.

MacCallum: Text-Book of Pathology, 1917. Saunders Co., Philadelphia.

OFFICIAL ANNOUNCEMENTS

TENTATIVE PROGRAM--STATE MEDICAL ASSOCIATION

TUESDAY, SEPTEMBER 20, 9 A. M.

Call to Order by the President..... W. W. ANDERSON, Newport
Invocation RT. REV. CHARLES E. WOODCOCK, Louisville
Address of Welcome S. J. MEYERS, M. D., Louisville
Response to Address of Welcome
C. G. STEPHENSON, M. D., Winchester
Installation of the President.

Address of the President J. A. STUCKY, M. D., Lexington
Report of Chairman of Committee on Arrangements
JOHN K. FREEMAN, M. D., Louisville

SCIENTIFIC SESSION--TUESDAY, SEPTEMBER 20, 10 TO 12 A. M.

Tuberculosis of the Spine ... ROBT. PIRTLE, M. D., Louisville
Federal Care of the Veterans
MILTON BOARD, M. D., Louisville
The Progress of Preventive Medicine
W. J. SHELTON, M. D., Mayfield

SPECIAL ORDER AT 12:00.

Oration in Surgery S. S. WATKINS, M. D., Louisville

SCIENTIFIC SESSION--TUESDAY, SEPTEMBER 20, 2 P. M.

Diagnostic Aids in Medicine
HENRY E. TULEY, M. D., Louisville
Study of Gall-Bladder by the Lyon-Meltzer Drain-
age Tube CURRAN POPE, M. D., Louisville
Observation on the Lyon-Meltzer Method for Diag-
nosis of Gall-Bladder and Duct Diseases
J. T. McClymonds, M. D., Lexington
The Application of Biologic Agents in the Diagnosis,
Prevention and Treatment of Contagious Diseases
JOHN F. ANDERSON, M. D., New Brunswick, N. J.
Blood Transfusion in Medical Diseases
J. ROWAN MORRISON, M. D., Louisville
Intestinal Perforation in Typhoid Fever
J. RICE COWAN, M. D., Danville

PUBLIC SESSION--TUESDAY, SEPTEMBER 20, 8 P. M. ..

Public Address STUART MCGUIRE, M. D., Richmond, Va.

SCIENTIFIC SESSION--WEDNESDAY, SEPTEMBER 21, 8:30 A. M.

Stone in the Upper Urinary Tract
OWSLEY GRANT, M. D., Louisville
Diagnosis of Urological Diseases
WM. T. BRIGGS, M. D., Lexington

Diagnosis and Pathology of Bladder Tumors
HERBERT BRONNER, M. D., Louisville

SYMPOSIUM ON PEDIATRICS

- (a) Colitis in Children
PHILIP BARBOUR, M. D., Louisville
- (b) Rectal Affections Observed in Children
GRANVILLE S. HANES, M. D., Louisville
- (c) Value of School Inspection
ANNIE VEECH, M. D., Louisville
- (d) Bronchial Asthma
THOS. M. MARKS, M. D., Lexington

SPECIAL ORDER AT 12:00.

Oration in Medicine P. D. GILLIM, M. D., Owensboro

SCIENTIFIC SESSION--WEDNESDAY, SEPTEMBER 21, 2 P. M.

Pellagra B. E. GIANNINI, M. D., Kembir
Goitre--Surgical Treatment
JOHN R. WATHEN, M. D., Louisville

SYMPOSIUM ON MALIGNANCY

- (a) Malignancy of the Breast
J. GARLAND SHERRILL, M. D., Louisville
- (b) Malignancy of the Uterus
LOUIS FRANK, M. D., Louisville
- (c) Treatment of Malignant Uterine Conditions
with Radium WOOLFOLK BARROW, M. D., Lexington
- (d) The Necessity for Early Recognition of Malig-
nancy of the Gastro-Intestinal Tract
JNO. H. BLACKBURN, M. D., Bowling Green
- (e) Malignancy of the Rectum
BERNARD ASMAN, M. D., Louisville
- (f) Treatment of Malignant Conditions with
Radium W. J. YOUNG, M. D., Louisville

SCIENTIFIC SESSION--THURSDAY SEPTEMBER 22, 9 A. M.

The Present Treatment of Syphilis with Especial
Reference to the Efficacy of Modern Methods
W. M. BRUNET, New York City

The Wassermann Reaction in Syphilis
L. K. BALDAUF, M. D., Louisville

Treatment of Neuro-Syphilis
H. J. FARBACH, M. D., Louisville

X-Ray Aspect of Chronic Small Intestinal Obstruct-
ion J. T. CASE, M. D., Battle Creek, Mich.

Schick Test and Other Features of Laboratory Work
L. H. SOUTH, M. D., Louisville

IRVIN LINDENBERGER, M. D., Louisville
ELLIS OWEN, M. D., Louisville

SCIENTIFIC SESSION--THURSDAY, SEPTEMBER 22, 2 P. M.

Immediate Repair of Lacerations Versus Delav.
ALICE PICKETT, M. D., Louisville

Various Methods of Performing Caesarian Section with
Indications and Contraindications
L. C. REDMON, M. D., Lexington

A Discussion of the Newer Fads in Obstetrics
EDWARD SPEIDEL, M. D., Louisville

Multiple Sclerosis
MORRIS FLEXNER, M. D., Louisville

Encephalitis
JOHN J. MOREN, M. D., Louisville

The Blood Platelets as Indicators of Hemorrhagic Diathesis.—H. C. Gram determined the bleeding time in various diseases by incision in the ear and wiping off the blood with filter paper every half minute until bleeding stops. In sixty-one persons with normal platelet numbers the time was one and one-half to four minutes. With platelets below 200,000, the period of bleeding is slightly prolonged. Below 100,000 the period is prolonged more than ten minutes. Thus, the bleeding time indicates roughly the number of platelets, and also affords an indication for or against an operation.



J. A. Shuckey

PRESIDENT KENTUCKY STATE MEDICAL ASSOCIATION, 1921

CONSTITUTION AND BY-LAWS OF THE
KENTUCKY STATE MEDICAL AS-
SOCIATION ADOPTED AT PA-
DUCAH IN 1902 AS
AMENDED.

—
CONSTITUTION.

ARTICLE I.—NAME OF THE ASSOCIATION.

The name and title of this organization shall be the Kentucky State Medical Association.

ARTICLE II.—PURPOSE OF THE ASSOCIATION.

The purpose of the Association shall be to federate and bring into compact organization the entire medical profession of the State of Kentucky, and to unite with similar associations in other states to form the American Medical Association, with a view to the extension of medical knowledge, and to the advancement of medical science, to the elevation of the standard of medical education, and to the enactment and enforcement of just medical laws; to the promotion of friendly intercourse among physicians, and to the guarding and fostering of their material interest and to the enlightenment and direction of public opinion in regard to the great problems of state medicine, so that the profession shall become more capable and honorable within itself, and more useful to the public in the prevention and cure of disease, and in prolonging and adding comfort to life.

ARTICLE III.—COMPONENT SOCIETIES

Component Societies shall consist of those county medical societies which hold charters from this Association.

ARTICLE IV.—COMPOSITION OF THE ASSOCIATION.

Section 1. This Association shall consist of Members, Delegates and Guests.

Sec. 2.—MEMBERS. The members of this Association shall be the members of the component county medical societies.

Sec. 3.—DELEGATES. Delegates shall be those members who are elected in accordance with this Constitution and By-Laws to represent their respective component county societies in the House of Delegates of this Association.

Sec. 4.—GUESTS. Any distinguished physician not a resident of this State may become a guest during any Annual Session upon invitation of the Association or its Council, and shall be accorded the privileges of participating in all of the scientific work of that Session.

ARTICLE V.—HOUSE OF DELEGATES.

The House of Delegates shall be the legislative and business body of the Association, and shall consist of (1) Delegates elected by the component county societies, and (2) *ex-officio*, the officers of the Association as defined in Article VIII, Section 1, of this Constitution.

ARTICLE VI.—SECTIONS AND DISTRICT SOCIETIES.

The House of Delegates may provide for a division of the scientific work of the Association into appropriate Sections, and for the organization of such Councilor District Societies as will promote the best interest of the profession, such societies to be composed exclusively of members of component county societies.

ARTICLE VII.—SESSIONS AND MEETINGS

Section 1. The Association shall hold an Annual Session, during which there shall be held daily not less than two General Meetings, which shall be open to all registered members, delegates and guests.

Sec. 2. The time and place for holding each Annual Session shall be fixed by the House of Delegates.

ARTICLE VIII.—OFFICERS.

Section 1. The officers of this Association shall be a President, three Vice Presidents, a Secretary, a Treasurer, and eleven Councilors.

Sec. 2. The President and Vice Presidents shall be elected for a term of one year. The Secretary, Treasurer and Councilors shall be elected for terms of five years each, the Councilors being divided into classes so that two shall be elected each year. All of these officers shall serve until their successors are elected and installed.

Sec. 3. The Officers of the Association shall be elected by the House of Delegates on the morning of the last day of the Annual Session, but no Delegate shall be eligible to any office named in the proceeding section, except that of Councilor, and no person shall be elected to any such office who is not in attendance upon the Annual Session and who has not been a member of the Association for the past two years.

ARTICLE IX.—FUNDS AND EXPENSES.

Funds for meeting the expenses of the Association shall be arranged for by the House of Delegates by an equal per capita assessment upon each county society to be fixed by the House of Delegates, by voluntary contribution, and from the profits of its publication.

Funds may be appropriated by the House of Delegates to defray the expenses of the Annual Session, for publication and for such other purposes as will promote the welfare of the Association and profession.

ARTICLE X.—REFERENDUM.

The General Meeting of the Association may, by a two-thirds vote, order a general referendum upon any question pending before the House of Delegates, and the House of Delegates may, by a similar vote of its own members, or after a like vote of the General Meeting, submit any such question to the membership of the Association for a final vote; and if the persons voting shall comprise a majority of all the members, a majority of such vote shall determine the question and be binding upon the House of Delegates.

ARTICLE XI.—THE SEAL.

The Association shall have a common Seal with power to break, change or renew the same at pleasure.

ARTICLE XII.—AMENDMENTS.

The House of Delegates may amend any article of this Constitution by a two-thirds vote of the delegates registered at that Annual Session, provided that such amendment shall have been presented in open meeting at the previous Annual Session and that it shall have been sent officially to each component county society at least two months before the session at which final action is to be taken.

BY-LAWS.

CHAPTER I.—MEMBERSHIP.

Section 1.—All members of the Component County Societies shall be privileged to attend all meetings and take part in all the proceedings of the Annual Session, and shall be eligible to any office within the gift of the Association. PROVIDED, that no physician may become a member of any county society unless he signs and keeps inviolate the following pledge:

I hereby promise upon my honor as a gentleman that I will not so long as I am a member of the Kentucky State Medical Association practice division of fees in any form; neither by collecting fees from others referring patients to me nor by permitting them to collect my fees for me; nor will I make joint fees with physicians or surgeons referring patients to me for operation or consultation; neither will I in any way, directly or indirectly, compensate anyone referring patients to me nor will I utilize any man as an assistant as a subterfuge for this purpose.

Sec. 2. The name of a physician upon the properly certified roster of members, or list of delegates, of a chartered county society which has paid its annual assessment, shall be *prima facie* evidence of his right to register at the annual session in the respective bodies of this Association.

Sec. 3 No person who is under sentence of suspension or expulsion from any component society of this Association or whose name has been dropped from its roll of members, shall be entitled to any of the rights or benefits of this Association, nor shall he be permitted to take part in any of its proceedings, until such time as he has been relieved of such disability.

Sec. 4. Each member in attendance at the Annual Session shall enter his name on the registration book, indicating the component society of which he is a member. When his right to membership has been verified by reference to the roster of the society, he shall receive a badge which shall be evidence of his right to all the privileges of membership at that session. No member or delegate shall take part in any of the proceedings of an annual session until he has complied with the provisions of this section.

CHAPTER II.—ANNUAL AND SPECIAL SESSIONS OF THE ASSOCIATION.

Section 1. The Association shall hold an annual session, meeting every third year in the city of Louisville, and the other two years at some point in the State fixed at the preceding annual session.

CHAPTER III.—GENERAL MEETING.

Section 1. The General Meeting shall include all registered members, delegates and guests, who shall have equal rights to participate in the proceedings and discussions; and except guests, to vote on pending questions. Each General Meeting shall be presided over by the President, or in his absence or disability, or upon his request, by one of the Vice Presidents. Before it, at such time and place as may have been arranged, shall be delivered the annual address of the President, and the annual orations and the entire time of the Sessions as far as may be shall be devoted to papers and discussions relating to scientific medicine.

Sec. 2. The general Meeting shall have authority to create committees or commissions for scientific investigations of special interest and importance to the profession and public, and to receive and dispose of reports of the same; but any expense in connection therewith must first be approved by the House of Delegates.

Sec. 3. Except by special vote, the order of exercises, papers and discussions as set forth in the official program shall be followed from day to day until it has been completed.

Sec. 4. No address or paper before the Association, except those of the President and Orators, shall occupy more than twenty minutes in its delivery; and no member shall speak longer than five minutes, nor more than once on any subject.

Sec. 5. All papers read before the Association shall be its property. Each paper shall be deposited with the Secretary when read, and if this is not done, it shall not be published.

CHAPTER IV.—HOUSE OF DELEGATES.

Section 1. The House of Delegates shall meet annually at the time and place of the Annual Session of the Association and shall so fix its hours of meeting as not to conflict with the first General Meeting of the Association, or with the meeting held for the address of the President and the annual orations, and so as to give delegates an opportunity to attend the other scientific proceedings and discussions so far as is consistent with the duties. But if the business interests of the Association and profession require, it may meet in advance or remain in session after the final adjournment of the General Meeting.

Sec. 2. Each component county society shall be entitled to send to the House of Delegates each year one delegate for every 25 members, and one for each major fraction thereof, but each county society holding a charter from this Association, which has made its annual report and paid its assessment as provided in this Constitution and By-Laws, shall be entitled to one delegate. In case the regularly elected delegate is unable to attend the annual meeting of the Association, the President of the county society shall have the power to appoint an alternate, who shall have the rights and privileges of a delegate.

Sec. 3. A majority of the registered delegates shall constitute a quorum and all of the meetings of the House of Delegates shall be open to members of the Association.

Sec. 4. It shall, through its officers, Advisory Council, and otherwise, give diligent attention to and foster the scientific work and spirit of the Association, and shall constantly study and strive to make each annual session a stepping stone to further ones of higher interest.

Sec. 5. It shall consider and advise as to the material interest of the profession, and of the public in those important matters wherein it is dependent upon the profession,

and shall use its influence to secure and enforce all proper medical and public-health legislation, and to diffuse popular information in relation thereto.

Sec. 6. It shall make careful inquiry into the condition of the profession of each county in the State, and shall have authority to adopt such methods as may be deemed most efficient for building up and increasing the interest in such county societies as already exist and for organizing the profession in counties where societies do not exist. It shall especially and systematically endeavor to promote friendly intercourse between physicians of the same locality and shall continue these efforts until every physician in every county of the State who can be made reputable has been brought under medical society influence.

Sec. 7. It shall encourage post-graduate work in medical centers as well as home study and research and shall endeavor to have the results of the same utilized and intelligently discussed in the county societies. With these ends in view, five years after the adoption of the By-Laws no voluntary paper shall be placed upon the annual program or be heard in the Association which has not first been heard in the county society of which the author is a member.

Sec. 8. It shall elect representatives to the House of Delegates of the American Medical Association in accordance with the Constitution and By-Laws of that body in such a manner that not more than one-half of the delegates shall be elected in any one year.

Sec. 9. It shall upon application provide and issue charters to county societies organized to conform to the spirit of the Constitution and By-Laws.

Sec. 10. In sparsely settled sections it shall have the authority to organize the physicians of two or more counties to be designated by hyphenating the names of two or more counties so as to distinguish them from district and other classes of societies and these societies, when organized and chartered shall be entitled to all the privileges and representation provided herein for county societies, until such counties may be organized separately.

Sec. 11. It may divide the counties of the State into Councilor Districts, and, when the best interests of the Association and profession will be promoted thereby, organize in each district a medical society, to meet midway between the Annual Sessions of the Association, and members of the chartered county societies and none other shall be members in such district societies. When so organized from the presidents of such district societies shall be chosen the Vice Presidents of this

Association and the Presidents of the county societies of the district shall be the Vice Presidents of such district societies.

Sec. 12. It shall have authority to appoint committees for special purposes from among members of the Association who are not members of the House of Delegates, and such committee may report to the House of Delegates in person, and may participate in the debate therein.

Sec. 13. It shall approve all memorials and resolutions issued in the name of the Association before the same shall become effective.

Sec. 14. It shall present a summary of its proceedings to the last general meeting of each annual session, and shall publish the same in the JOURNAL.

CHAPTER V.—ELECTION OF OFFICERS.

Section 1. All elections shall be by secret ballot, and a majority of the votes cast shall be necessary to elect, provided, however, that when there are more than two nominees, the nominee receiving the least number of votes on the first ballot shall be dropped and the balloting continue until an election occurs in like manner.

Sec. 2. Any member known to have directly or indirectly solicited votes for or sought any office within the gift of this Association shall be ineligible for any office for two years.

Sec. 3. The election of officers shall be the first order of business of the House of Delegates after the reading of the minutes on the morning of the last day of the General session.

Sec. 4. Nominations for President shall be called for by counties.

CHAPTER VI.—DUTIES OF OFFICERS.

Section 1. The President shall preside at all meetings of the Association and of the House of Delegates; shall appoint all committees not otherwise provided for; shall deliver an annual address at such time as may be arranged; shall give a deciding vote in case of a tie, and shall perform such other duties as custom and parliamentary usage may require. He shall be the real head of the profession of the State during his term of office, and so far as practicable, shall visit by appointment, the various sections of the State and assist the Councilors in building up the county societies and in making their work more practical and useful.

Sec. 2. The Vice Presidents shall assist the President in the discharge of his duties. In the event of his death, resignation or re-

moval the Council shall elect one of the Vice Presidents to succeed him.

Sec. 3. The Treasurer shall give bond for the trust imposed in him whenever the House of Delegates shall deem it requisite. He shall demand and receive all funds due the Association, together with the bequests and donations. He shall, under the direction of the House of Delegates, sell or lease any estate belonging to the Association and execute the necessary papers; and shall, in general, subject to such direction, have the care and management of the fiscal affairs of the Association. He shall pay money out of the Treasury, only on written order of the President, countersigned by the Secretary; he shall subject his accounts to such examination as the House of Delegates may order, and he shall annually render an account of his doings and of the state of funds in his hands.

Sec. 4. The Secretary, acting with the Committee on Scientific Work, shall prepare and issue the program for and attend all meetings of the Association and of the House of Delegates and he shall keep minutes of their respective proceedings in separate record books. He shall charge upon his books the assessments against each component county society at the end of the fiscal year; he shall collect and make proper credits for the same, and perform such other duties as may be assigned to him. He shall be custodian of all record books and papers belonging to the Association, except such as properly belong to the Treasurer, and shall keep account of and promptly turn over to the Treasurer all funds of the Association which come into his hands. He shall provide for the registration of the members and delegates at the Annual Sessions. He shall keep a card index register of all the legal practitioners of the State by counties, noting on each his status in relation to his county society and upon request shall transmit a copy of this list to the American Medical Association for publication. In so far as it is in his power he shall use the printed matter, correspondence and influence of his office to aid the Councilors in the organization and improvement of the county societies and in the extension of the power and usefulness of this Association. He shall conduct the official correspondence, notifying members of meetings, officers of their election, and committees of their appointment and duties. He shall act as secretary of the Committee on Scientific Work. He shall be editor of the KENTUCKY MEDICAL JOURNAL. He shall employ such assistants as may be ordered by the Council or the House of Delegates. He shall annually make a report of his doings to the House of Delegates.

In order that the Secretary may be enabled to give that amount of time to his duties which will permit of his becoming proficient it is desirable that he shall receive some compensation. The amount of his salary shall be fixed by the House of Delegates.

CHAPTER VII.—COUNCIL.

Section 1. The Council shall hold daily meetings during the annual session of the Association and at such other times as necessity may require, subject to the call of the Chairman or on petition of three Councilors. It shall meet on the last day of the annual session of the Association for re-organization and for the outlining of the work for the ensuing year. At this meeting it shall elect a Chairman and Secretary and it shall keep a permanent record of its proceedings. It shall, through its Chairman, make an annual report to the House of Delegates at such times as may be provided, which report shall include an audit of the account of the Secretary and Treasurer and other agents of this Association and shall also specify the character and cost of all the publications of the Association during the year, and the amount of all other property belonging to the Association, or under its control, with such suggestions as it may deem necessary. In the event of a vacancy in any office the Council may fill the same until the next annual election.

Sec. 2. Each Councilor shall be organizer, peacemaker and censor for his district. He shall visit each county in his district at least once a year for the purpose of organizing component societies where none exist, for inquiring into the condition of the profession and for improving and increasing the zeal of the county societies and their members. He shall make an annual report of his doings, and of the condition of the profession of each county in his district to each annual session of the House of Delegates. The necessary traveling expenses incurred by such Councilor in the line of the duties herein imposed, may be allowed by the House of Delegates upon a proper itemized statement, but this shall not be construed to include his expenses in attending the annual session of the Association.

Sec. 3. Collectively the Council shall be the board of Censors of the Association. It shall consider all questions involving the right and standing of members, whether in relation to other members, to the component societies, or to this Association. All questions of an ethical nature brought before the House of Delegates or the General Meeting shall be referred to the Council without discussion. It shall hear and decide all questions of dis-

cipline effecting the conduct of members or of a county society upon which appeal is taken from the decision of an individual Councilor. Its decision in all such cases shall be final.

Sec. 4. The Council shall have the right to communicate the views of the profession and of the Association in regard to health, sanitation and other important matters to the public and the lay press. Such communications shall be officially signed by the chairman and secretary of the Council, as such.

Sec. 5. The Council shall provide for and superintend the publication and distribution of all proceedings, transactions and memoirs of the Association and shall have authority to appoint such assistants to the editor as it deems necessary. It shall manage and conduct the KENTUCKY MEDICAL JOURNAL, which is the organ of the Association, and all money received by the JOURNAL, the Council or any officer of the Association, shall be paid to the Treasurer of the Association on the first of each month.

Sec. 6. All reports on scientific subjects and all scientific discussions and papers heard before the Association shall be referred to the KENTUCKY MEDICAL JOURNAL for publication. The editor, with the consent of the Councilor for the District in which he resides may curtail or abstract papers or discussions, and the Council may return any paper to its author which it may not consider suitable for publication.

Sec. 7. All commercial exhibits during the annual session shall be within the control and direction of the Council.

CHAPTER VIII.—COMMITTEES.

Section 1. The standing committees shall be as follows:

A Committee on Scientific Work.

A Committee on Public Policy and Legislation.

A Committee on Medical Education.

A Medico-Legal Committee.

A Committee on Arrangements, and such other committees as may be necessary. Such committees shall be elected by the House of Delegates, unless otherwise provided.

Sec. 2. The Committee on Scientific Work shall consist of three members of which the President-elect shall be a member and Chairman, and the Secretary shall be a member and Secretary, and shall determine the character and scope of the scientific proceedings of the Association, subject to the provisions or the instructions of the House of Delegates or of the Association, or to the provisions of the Constitution and By-Laws. Thirty days previous to each annual session it shall prepare

and issue a program announcing the order in which papers, discussions and other business shall be presented, which shall be adhered to by the Association as nearly as practicable.

Sec. 3. The Committee on Public Policy and Legislation shall consist of three members and the President and Secretary. Under the direction of the House of Delegates it shall represent the Association in securing and enforcing legislation in the interest of the public health and scientific medicine. It shall keep in touch with the profession and public opinion, shall endeavor to shape legislation so as to secure the best results for the whole people, and shall utilize every organized influence in local, state and national affairs and elections. Its work shall be done with dignity becoming a great profession and with that wisdom which will make effective its work and influence. It shall have authority to be heard before the entire Association upon questions of great concern at such times as may be arranged during the annual session.

Sec. 4. The Committee on Arrangements shall consist of the component society in the territory in which the annual session is to be held. It shall, by committees of its own selection, provide suitable accommodations for the meeting-places of the Association and of the House of Delegates, and of their respective committees, and shall have general charge of all arrangements. Its Chairman shall report an outline of the arrangements to the Secretary for publication in the program, and shall make additional announcements during the session as occasion may require.

Sec. 5. The Medico-Legal Committee shall consist of three members, one of whom, the Chairman, shall be elected by the Council for five years, and the Secretary and Treasurer shall be the other two members *ex officio*. This committee shall select and fix the compensation for an attorney, who shall act as General Counsel, and if required, additional local counsel. The Association through this Committee shall defend its members who are in good standing against unjust suits for malpractice.

CHAPTER IX.—ASSESSMENTS AND EXPENDITURES.

Section 1.—The assessment of four dollars per capita on the membership of the component societies is hereby made the annual dues of this Association. The Secretary of each county society shall forward its assessment together with its roster of all officers and members, lists of delegates, and list of non-official physicians of the county to the Secretary of this Association on the first day of January in each year.

Sec. 2. Any county society which fails to pay its assessment, or make the report required, on or before the first day of April in each year, shall be held as suspended, and none of its members, or delegates shall be permitted to participate in any of the business or proceedings of the Association or of the House of Delegates until such requirements have been met.

Sec. 3. All motions or resolutions appropriating money, shall specify a definite amount, or so much thereof as may be necessary for the purpose indicated, and must be approved by the Council and House of Delegates.

CHAPTER X.—RULES OF CONDUCT.

The principles set forth in the Principles of Ethics of the American Medical Association shall govern the conduct of members in their relations to each other and to the public.

CHAPTER XI.—RULES OF ORDER.

The deliberations of this Association shall be governed by parliamentary usage as contained in Roberts' Rules of Order, unless otherwise determined by a vote of its respective bodies.

CHAPTER XII.—COUNTY SOCIETIES

Section 1. All county societies now in affiliation with the State Association or those that may hereafter be organized in this State, which have adopted principles of organization not in conflict with this Constitution and By-Laws, shall, upon application to the House of Delegates, receive a charter from and become a component part of this Association.

Sec. 2. As rapidly as can be done after the adoption of this Constitution and By-Laws, a medical society shall be organized in every county in the State in which no component society exists, and charters shall be issued thereto.

Sec. 3. Charters shall be issued only upon approval of the House of Delegates and shall be signed by the President and Secretary of this Association. The House of Delegates shall have authority to revoke the charter of any component county society whose actions are in conflict with the letter or spirit of this Constitution and By-Laws.

Sec. 4. Only one component medical society shall be chartered in any county. Where more than one county society exists, friendly overtures and concessions shall be made with the aid of the Councilor for the District if necessary, and all of the members brought into one organization. In case of failure to unite, an appeal may be made to

the Council, which shall decide what action shall be taken.

Sec. 5. Each county society shall judge of the qualifications of its own members, but as such societies are the only portals to this Association, every reputable and legally registered physician who is practicing, or who will agree to practice, non-sectarian medicine shall be entitled to membership. Before a charter is issued to any county society, full and ample notice and opportunity shall be given to every physician in the county to become a member.

Sec. 6. Any physician who may feel aggrieved by the action of the society of his county in refusing him membership, or in suspending or expelling him, shall have the right to appeal to the Council, which, upon a majority vote, may permit him to become a member of an adjacent county society.

Sec. 7. In hearing appeals the Council may admit oral or written evidence as in its judgment will best and most fairly present the facts, but in case of every appeal, both as a Board and as individual councilors in district and county work, efforts at conciliation and compromise shall precede all such hearings.

Sec. 8. When a member in good standing in a component society moves to another county in the State, his name, upon request shall be transferred without cost to the roster of the county society into whose jurisdiction he moves.

Sec. 9. A physician living in or near a county line may hold membership in that county most convenient for him to attend, on permission of the society in whose jurisdiction he resides.

Sec. 10. Each county society shall have general direction of the affairs of the profession in the county, and its influence shall be constantly exerted for bettering the scientific, moral and material conditions of every physician in the county; and systematic efforts shall be made by each member, and by the society as a whole, to increase the membership until it embraces every qualified physician in the county.

Sec. 11. Frequent meetings shall be encouraged, and the most attractive programs arranged that are possible. The younger members shall be especially encouraged to do post-graduate and original research work, and to give the society the first benefit of such labors. Official position and other preferences shall be unstintingly given to such members.

Sec. 12. At the time for the annual election of officers each county society shall elect a delegate or delegates to represent it in the

House of Delegates of this Association in the proportion of one delegate to each twenty-five members or major fraction thereof, and the secretary of the society shall send a list of such delegates to the Secretary of this Association at least sixty days before the Annual session.

Sec. 13. The Secretary of each county society shall keep a roster of its members, and a list of the non-affiliated registered physicians of the county, in which shall be shown the full name, address, college and date of graduation, date of license to practice in this State, and such other information as may be deemed necessary. He shall furnish an official report containing such information, upon blanks supplied him for the purpose, to the Secretary of this Association, on the first day of January of each year, or as soon thereafter as possible, and at the same time that the dues accruing from the annual assessment are sent in. In keeping such roster the Secretary shall note any changes in the personnel of the profession by death, or by removal to or from the county, and in making his annual report he shall be certain to account for every physician who has lived in the county during the year.

Sec. 14. The Secretary of each county society shall report to the KENTUCKY MEDICAL JOURNAL full minutes of each meeting and forward to it all scientific papers and discussions which the Society shall consider worthy of publication.

CHAPTER XIII.—AMENDMENTS.

These By-Laws may be amended by any annual session by a two-thirds vote of all the delegates present at that session, after the amendment has been laid on the table for one day.

Pathology of Disturbance from Fat in Infant Feeding.—In this first communication on this subject, Bessau discusses the clinical aspect of the *Milchnahrshaden*, and emphasizes that the light color of the stools is the only symptom by which the clinician can recognize the condition. The decoloration of the bile pigment is the clinical indicator of it, and the process which accomplishes this is probably the cause of the clinical disturbances. Everything tends to incriminate both fat and protein as the causes, while, on the other hand, promotion of fermentation processes in the intestines is effectual treatment for it. Breast-fed children may develop "white dyspepsia," but this is not due to decoloration of bile pigment, as in the fat dyspepsia. The latter is cured at once by changing the child from cow's to breast milk; there may still be disturbances of various kinds, but not of *Milchnahrshaden* type.

REPORT OF THE COUNCIL TO THE HOUSE OF DELEGATES.

While during the past year there has been a slight increase in membership, the Council feels that there has not been the renaissance which should have occurred following the reestablishment of the profession which has followed the return of practically all of our members who were in the army. The percentage of the Kentucky physicians in the Association has never been so large, and its influence and opportunity for work has consequently never been greater.

In our last report we emphasized the danger to the profession itself, and through it to the people it serves, of the entire change in the education of physicians so that too many of the new graduates are locating in the centers of population and too few are returning to the rural districts where they are most needed. This situation has been recognized all over the United States, and the Council on Public Health Legislation of the American Medical Association had a special meeting last July at which, among others, the following questions were discussed: (1) Have we enough doctors in this country? (2) Are they doing work as it should be done? (3) What steps should be taken to induce our medical schools to better prepare our doctors? (4) It is generally admitted that the best medical schools do not give adequate instruction in preventive medicine. What should be done to improve education in this line? (5) It is generally admitted that the average physician deteriorates after leaving medical school. What can be done to prevent this? (6) Is the American Medical Association manifesting sufficient interest either in preventive medicine or improving the conditions under which the average doctor practices his art? After several months consideration the following statement was formulated and published in the *Journal American Medical Association* for December 4, 1920:

"The Council believes it highly desirable that the nature and transmission of communicable diseases should be taught in the public schools of the country. This is already a legal requirement in a few states. In other states such instruction is confined to tuberculosis. The secretary of the Council was requested to gather such information as he may be able to find bearing in this matter and to have framed a model bill for introduction into the legislatures of the states which do not already provide for such instruction.

The Council believes that teachers in our public schools should know something about the communicable diseases and what should

be done with pupils under their charge developing these diseases. The Council believes that a course in epidemiology should be required in all normal schools and in schools of education in our universities; in short, that no one should be licensed to teach without having had instruction in epidemiology. The secretary of the Council was requested to have formulated a model bill bearing upon this subject.

The Council on Health and Public Instruction believes that the American Medical Association should take steps to secure the following results:

(a) To assist local medical practitioners by supplying them with proper diagnostic facilities.

(b) To provide for residents of rural districts, and for all others who cannot otherwise secure such benefits, adequate and scientific medical treatment, hospital and dispensary facilities and nursing care.

(c) To provide more efficiently for the maintenance of health in rural and isolated districts.

(d) To provide for young physicians who desire to go to rural localities, opportunities for laboratory aid in diagnosis.

(e) The Council believes that these results can be best secured by providing in each rural community a hospital with roentgen-ray and laboratory facilities to be used by the legally qualified physicians of the community. The secretary of the Council was requested to study the laws of the different states bearing upon this subject and to prepare a model bill to be studied more fully at the meeting of the Council in March, 1922."

These matters are of such great importance that the American Medical Association has called a conference during the coming summer to which the President and Secretary of this Association have been invited, and the Council recommends that they be sent as our delegates.

At the meeting of the Conference of State and Provincial Health Authorities of North America, and at which Kentucky was represented by Dr. John G. South, President, and Dr. A. T. McCormack, Secretary, of our State Board of Health, the following memorial was presented to the American Medical Association:

"Whereas, Economic and sociological conditions in the United States are causing the deprivation of many of our people, especially in rural districts, of sufficient, and, frequently, of any medical service; and,

Whereas, The physical examination of five millions of our young men during the war revealed that the present system of medical

practice is inadequate for the detection, prevention or treatment of many diseases and physical defects which are causing inefficiency; and unnecessary diseases and suffering, leading to premature death, thus literally wasting millions of dollars annually; and,

Whereas, This reckless waste of our American manhood and womanhood is due to insufficient education of physicians, nurses and others responsible for the public health, and therefore of the general public, in personal hygiene and preventive medicine, especially in the care of babies and children and in the importance of systematic periodic examination of apparently well people for the purpose of the prevention of early correction of disease and defects; and

Whereas, A few state medical organizations have hastily approved resolutions which confuse preventive medicine with health insurance to which this organization is unalterably opposed; now, therefore, be it

Resolved, That the Conference of State and Provincial Health Authorities of North America—composed entirely of physicians, jealous of the reputation of the profession of whose history and achievements we are justly proud, since it has contributed so much towards every practical step, in the reduction and prevention of disease—urges that the organized medical profession shall accept its responsibility for progress in the prevention of ill health and its causes, and shall support through county and municipal medical societies such diagnostic teaching and other clinics as will bring to all the people, whether living in the cities or in the country, all of the knowledge and means necessary to enable the members of every community, however remote from medical centers, to live through the years of their natural expectation with the utmost possible freedom from preventable and remediable disease and defects; and, be it further

Resolved, That this resolution be presented to the American Medical Association with the request that its principles be approved and that, through its great journal, and its Councils and other agencies, it exercise its responsibility for leadership in improving the education of the profession and the public in personal hygiene and preventive medicine.

This memorial, together with many resolutions, was carefully considered by the House of Delegates of the American Medical Association and its committees throughout the session and on the last day the following resolution was unanimously adopted:

Resolved, by the House of Delegates of the American Medical Association that it approves and indorses all proper activities and policies

of State and Federal governments directed to the prevention of disease and preservation of public health.

The discussion brought out the unique position which Kentucky holds in relation to its public health activities. The medical profession and our health authorities are inseparable and it is impossible that there can be a division between them because they are both recognized by the State as indivisible. This fortunate condition in our state was emphasized repeatedly in the discussion which brought out a sharp line of demarkation between the activities and desires of the organized medical profession and those of its members who have embraced the specialty of preventive medicine and have become officials of the nation, states or counties. As an organization, we must recognize as stated in the memorial above referred to, that the present system of medical practice is inadequate for the detection, prevention or treatment of many diseases and physical defects which are causing inefficiency and unnecessary disease and suffering leading to premature death, and it is clearly time that the organized medical profession shall accept its responsibilities toward ill health and its causes, and shall support through its county and municipal medical societies such diagnostic, teaching and other clinics, as will bring to all people, whether living in the cities or in the country, all of the knowledge and means necessary to enable the members of every community, however remote from medical centers to live through the years of their natural expectation with the utmost possible freedom from preventable and remedial diseases, and defects.

The Council urges that this problem be given thorough consideration by the House of Delegates, and that steps be taken now to formulate a policy which may not only serve to lessen defects in Kentucky, but which may serve as a model for the less fortunate states which are not so well organized as Kentucky. The Council on Medical Education at the Boston Association emphasized the importance of this matter in stating, "The medical profession must be awakened to its greater opportunities and responsibilities, which means the organization of the profession for further developing the practice of modern scientific medicine."

The Council on Medical Education has at last realized what every thoughtful medical practitioner has known constantly that the education and training of the general practitioner is the *sine qua non* of medical progress. During the early years of medical education in the United States, it was recognized that while there is a science of medicine, that it is

the art of medicine that is of the most importance to most physicians and to all of the people. To this end, every student of medicine served an apprenticeship under a preceptor who instilled into his mind not only the ideals which have been handed down from the father of medicine, but the actual means and methods by which he should practice his art.

In recent years, students in medical colleges have been taught only the science of medicine, and many of them leave the colleges after graduation with a wonderfully improved knowledge of science, but with far too little instruction as to how to apply it to the clientele which awaits them. In fact, the pendulum has swung so far that many of the so-called higher institutions for medical education have been turning out graduates which they allege were fully equipped as specialists in limited fields of practice, and quite a few of them have required these informed and uninformed young men to elect the special branch of medicine which they were to practice while still undergraduates. This tendency on the part of our great Universities has unfortunately developed over-specialization, and has rather inclined the public to a distrust of the general practitioner, and it is now unfortunately the case that many people feel that they have not been adequately diagnosed or treated until they have been examined by a group of specialists, obviously an impossibility financially or physically for the vast majority of our population. This movement on the part of our profession has increased the evils of self medication and medical nihilism and itself is largely responsible for the development of the non-medical sects which merit our contempt because they so greatly endanger the public health, but which are natural sequistors of an era in medical education which has tended to destroy the influence of the family physician.

Fortunately the Council on Medical Education has recognized the evils of this whole movement and has faced the medical colleges squarely about so that hereafter all undergraduate instruction will be directed toward the sole purpose of training general practitioners, and those general practitioners who desire to limit their practice to the special branches of our art will be required to take real post graduate courses which will give them the special qualifications which are required.

Fortunately this Association has looked forward to the development of such a movement, and at the last session of the General Assembly in the passage of the law recognizing the medical cults and requiring examination in the fundamental branches for all who desire to practice them, provided by

this law for the establishment of Assistant Examiners to the State Board of Health who should examine those who desire to practice exclusively any limited branch of medicine. In order to make this provision of law effective, the Council has called meetings of those engaged in limited branches in the State for the first day of the annual session this year so that they may organize under the law and nominate to the Board such Assistant Examiners. It is felt that this is a distinct step in advance, and it is a matter of considerable pride to the Council, as it will undoubtedly be to the profession as a whole, that Kentucky will, as usual, lead in a movement which is sure to become national in its scope.

All of us now engaged in the practice of medicine realize how defective was our undergraduate training in preventive medicine. Those of our number who have embraced this specialty understand best of all the difficulties that have confronted us as we have groped our way in the school of experience, only becoming really qualified after many years of arduous and not infrequently wasteful labor. It is quite gratifying, therefore, to know that hereafter ninety hours will be required in preventive medicine for each undergraduate student. The Board of Trustees, the Faculty of the Department of Medicine of the University of Louisville have very wisely gone much further in the opportunities given to its students by offering them elective courses which will qualify them while still undergraduates so that they may enter the field of public health without the handicap which we have so constantly felt.

It is most gratifying to note the constant improvement in the courses of instruction of the University of Louisville. Nine-tenths of the physicians in Kentucky are graduates of this institution or its predecessors, and always will be. It is, therefore, of the utmost importance that the organized profession of Kentucky see to it that medical students are being trained from every county in the State to take the place of those who are retiring or who are gathered by the grim reaper.

It is quite alarming that there have been no medical students from more than sixty of our counties within the past five years, and it is to be noted that there are practically no physicians under forty years of age located or locating outside of the cities or industrial centers. This situation must be understood by the profession and the people, and must be remedied.

There are in Kentucky at this time eleven counties or cities which have all-time health officers. Many other counties are ready for such officials, but are unable to secure them

because the remuneration offered is not causing enough of our profession to qualify themselves in public health. It is the duty of the profession to bring this to the attention of the young men so that others will qualify. In recent articles Dr. John A. Ferrell of the International Health Board, has emphasized the fact that there are now openings literally for thousands of health officers or specialists in preventive medicine who will begin their practice with an annual income of approximately \$2,400, and to whom are available promotions up to from \$6,000 to \$12,000, and that such positions are increasing far more rapidly than they can be filled by competent men.

At the same time there is developing an enormously increased demand for nurses. This is unquestionably the noblest profession that is open to women, and it is urged that members of the profession bring to the attention of the young women of their community, of the highest type of physical, moral and mental development, the opportunities of leadership and usefulness as trained nurses. Fortunately there is no reason for any young woman leaving Kentucky for such training, and the hospitals where training is given provide for the adequate support of their students during the three year course which is required. As in medicine, the demand for specialists in preventive medicine is rapidly increasing, so in nursing, there is a tremendous increase in the demand for public health nurses. It is rapidly becoming understood by people generally that a community which has not the services of a public health nurse available is a backward community. The popular demand for them has far outrun the supply. In Kentucky at present adequate salaries have been provided for more than fifty such public health nurses, and it is only possible to supply them, if at all, by importing them from other states. This is inexcusable and a reproach upon our profession and our people. The University of Louisville and State Board of Health have, by splendid co-operation, created a School of Public Health in which physicians are trained as health officers, and nurses as public health nurses. Similar institutions have been created and are largely patronized in other states. It is unfortunate that the majority of the students in our own school of public health have so far come from other states. The Council desires to urge upon the House of Delegates the importance of taking immediate steps to augment not only the number of students in the undergradnate schools, and hospitals for physicians and nurses, but for an immediate increase in the number of students in the school of public health who can qualify them-

selves to take positions as health officers and public health nurses.

At the recent session of the American Medical Association, State Associations were urged to increase their dues so that they might indemnify such of their members as were unjustly sued for malpractice against financial loss. This matter is referred to the House of Delegates for such action as it may deem appropriate.

Since our last annual session, Mrs. Irvine, a granddaughter of Ephriam McDowell, has died, leaving to this Association her beautiful home at Richmond, Kentucky, for the purpose of establishing a memorial to the great father of ovariectomy. It has been suggested that this be made a hospital for the aged and infirm of our profession and dependent members of their families. This has long been the dream of the profession in many States, and is a matter of so much importance that the Council is asking the County Societies to consider the matter so that their delegates may come to Louisville instructed as to the wishes of the profession.

The Council desires to report to the House of Delegates that the County Societies are doing both the best and the worst work that they have done since our reorganization in 1897. Many societies are holding regular meetings where such excellent programs are being presented that no member can afford to be absent. On the other hand, many of the societies have not held meetings during the year at all, and have merely kept up the form of the society so as to obtain the privileges without accepting any of the responsibilities or duties of membership. It has been suggested that this Association employ post graduate instructors who shall spend such time in each county as the local profession shall desire and who can assist in the rehabilitation of the local organization, getting them started so that they can continue to function as is intended by the very character of our organization. This suggestion is commended to the attention of the House of Delegates.

During the year, notable progress has been made in the JOURNAL. Unfortunately, due to strikes in the printing trade, and other conditions over which we had no control, most of the issues have been late, but the printers have been penalized so that it has made the expense of publication less than heretofore, although more pages have been printed than during any year since its establishment. The Council again desires to emphasize the importance of the JOURNAL's advertising pages. It must be realized by each of our members that we could not continue the publication of the

JOURNAL for a single month without the money provided by our advertising.

They pay more for advertising in our JOURNAL in proposition to its circulation than in any other in the country because we restrict our advertising pages to those whose reputation for probity and square dealing is such that they can be accepted without question. We guarantee our readers against financial loss from any financial dealing with one of our advertisers. It is pleasant to report that there has not been a claim under this guarantee during this past year. Many more pages of advertising are rejected for each issue than are accepted. This fortunate condition can only continue if each of our members recognizes the debt of gratitude he owes to each of our advertisers. If any sanatorium or pharmaceutical or publishing house is seeking your patronage and is not advertised in the JOURNAL, you may accept it as a fact that they would be advertised there if we would accept them, but if for some reason they are excluded, you had best be on your guard in dealing with them.

The finances of the Association are in satisfactory condition at present, but the apparent balance at the end of the fiscal year is misleading, as unpaid accounts for the current month and for the last two issues of the JOURNAL are still to be deducted. The treasurer's and auditor's reports show in exact detail how every penny of the Association's money has been expended. The members are urged to read these reports, as only in this way can they know whether to commend or criticize our management.

The last session of the General Assembly placed in the hands of the State Board of Health the examining and licensing of all cults and sects which treat sick people in any way. The wise administration of this law has been largely in the hands of Dr. J. N. McCormack, and it is gratifying to know that the health and lives of our people are being protected from the hords of ignorant and untrained men who are swarming in states whose legislators have failed to realize their danger to their people. If a man or woman has had the basic education that enables him or her to make diagnoses so that they know when not to do things, they can, most of the time, be safely trusted with what they have been taught to do. Complaints are frequently made as to the failure to enforce the medical practice or other law. These failures are matters which should be discussed in each county by the local profession. Where the county and circuit judges, and county and Commonwealth's attorneys are competent and honest, there is never any question about law enforcement. Where they are ignorant and

servile these laws and others are but little expected. This Association and the State Board of Health have joined in the employment of Hon. Elwood Hamilton, of Louisville, as their attorney, and they are ready to assist in the enforcement of the law wherever the physicians in each county secure the necessary evidence. It is obviously impossible for any one man to work up the evidence and carry all the cases through the courts, but we are ready to help in the conduct of the case in the court when the evidence is ready to be presented. Arrangements have already been completed with Mr. Hamilton so that the pleadings and other papers in all malpractice cases will be prepared or revised, and it is urged that all suits or threatened suits for malpractice be brought to the attention of the Medico Legal Committee as soon as they arise, and the profession is hereby put on notice that the Association will under no circumstances pay an attorney's fee unless it is consulted before his employment.

Respectfully submitted,
R. C. McCHORD, M. D.,
Chairman.

AUDITOR'S REPORT.

To the Council of the Kentucky State Medical Association:

GENTLEMEN:

At your request I have audited the books of your Treasurer, Dr. W. B. McClure, and your Secretary, Dr. A. T. McCormack, from September 1, 1920, to September 1, 1921, and beg to submit the following report:

Reconciliation of Treasurer's report of Receipts and Disbursements with that of Secretary:

Total amount received from Secretary	\$12756 05	
Total amount in transit from Secretary	955 99	
Total amount collections by Secretary		\$13712 04
Total Vouchers paid by Treasurer	\$11474 91	
Amount outstanding beginning of year	356 00	
	\$11118 91.	
Amount outstanding close of year	1158 85	
Total Vouchers issued by Secretary No. 1 to No. 101	\$12277 76	

Reconciliation of Treasurer's Cash Balance with Secretary:

Cash balance in Second National Bank, Lexington, Kentucky, to the credit of W. B. McClure, Treasurer	\$ 7827 99
Remittance from Secretary in transit	955 99
	\$ 8783 98

Less outstanding vouchers, viz:			
No. 329—T. W. Singer, Chicago..\$	6	00	
No. 84—A. P. Hunt, Fullerton . . .	1	00	
No. 86—L. H. South, Louisville . . .	50	00	
No. 88—W. C. Morris, Bowling Green	50	00	
No. 93—A. T. McCormack, Louisville	150	00	
No. 94—L. H. South, Louisville . .	50	00	
No. 95—Edith Landrum, Louisville..	50	00	
No. 96—Bush-Krebs, Louisville....	25	95	
ciation, Chicago	40	00	
No. 97—American Medical Asso-			
No. 98—Times-Journal Pub. Co., Bowling Green	485	90	
No. 99—A. T. McCormack, Louisville	150	00	
No. 100—L. H. South, Louisville . .	50	00	
No. 101—Edith Landrum, Louisville	50	00	1158 85
Net cash balance, agreeing with Secretary	\$	7625	13
3 Liberty Bonds, face value, in hands of the Treasurer		3000	00
Total cash assets		\$10725	13
Office Furniture, etc (Sec Exhibit "D")		847	39

Checks 99 to 101, inclusive, are post-dated and are in the hands of the Secretary to be delivered when due.

I have carefully compared every item and checked same from every angle and find same correct and the books in balance and neatly kept.

A full history of the year's work is shown in detail and summary in the following exhibits, which have been checked and proved.

Very truly,

B. P. EUBANK, Auditor.

EXHIBIT "A"

Detailed Statement of Disbursements of W. B. McClure, Treasurer, Kentucky State Medical Association, each made on a Voucher Check signed by Dr. W. W. Anderson, President, and Dr. A. T. McCormack, Secretary, and himself, from September 1, 1920, to September 1, 1921:

October 1—Voucher Check No. 1	\$	4	25
THE BOOK SHOP BINDERY, Chicago.			
To bound copy of KENTUCKY MEDICAL JOURNALS for 1919.			
Approved by the Council and ordered paid by the House of Delegates.			
October 1—Voucher Check No. 2	\$	7	50
UNIVERSITY BOOK STORE, Lexington.			
To 500 envelopes for Dr. McClure.			
Approved by the Council and ordered paid by the House of Delegates.			
October 1—Voucher Check No. 3	\$	62	00
DR. JOHN W. SCOTT, Lexington.			
To expenses as delegate at the National Convention at Washington, D. C.			
Approved by the Council and ordered paid by the House of Delegates.			
October 1—Voucher Check No. 4	\$	15	75
BUSH & KREBS, Louisville.			
To drawing and floor plans.			
Approved by the Council and ordered paid by the House of Delegates.			
October 1—Voucher Check No. 5	\$	22	50
C. T. DEARING PRINTING CO., Louisville.			
To applications	\$	9	00
To circulars		8	25
To copies of floor plans		5	25
Approved by the Council and ordered paid by the House of Delegates.			
October 1—Voucher Check No. 6	\$	778	49
TIMES-JOURNAL PUBLISHING CO., Bowling Green.			
To 500 letter heads and 500 envelopes C. Sixth District	\$	6	50
To July issue JOURNAL, 64 pages.		210	00
To difference in cost of paper		85	75
To 24 changes		4	80
To 20 per cent added		42	00
To printing envelopes		2	30
To cash paid W. C. Morris for postage on JOURNAL		30	34
To 500 letter heads and envelopes C. Tenth District.		6	50
To August issue JOURNAL, 72 pages.		230	00
To difference in cost of paper		96	25
To 20 per cent added		46	00
To 15 changes		3	00
To catalogue envelopes		12	75
To printing envelopes		2	30
Approved by the Council and ordered paid by the House of Delegates.			
October 1—Voucher Check No. 7	\$	228	56
DR. A. T. McCORMACK, Louisville.			
To salary as Secretary	\$	150	00
To expenses to Lexington.		78	56
Approved by the Council and ordered paid by the House of Delegates.			
October 1—Voucher Check No. 8	\$	78	00
DR. L. H. SOUTH, Louisville.			
To salary Business Manager	\$	50	00
To expenses		28	00
Approved by the Council and ordered paid by the House of Delegates.			
October 1—Voucher Check No. 9	\$	50	00
EDITH LANDRUM, Louisville			
To salary as Bookkeeper.			
Approved by the Council and ordered paid by the House of Delegates.			

October 1—Voucher Check No. 10.....	\$ 10 00
DR. J. W. KINCAID, Catlettsburg.	
To expense as Councilor.	
Approved by the Council and ordered paid by the House of Delegates.	
October 1—Voucher Check No. 11.....	\$ 5 40
DR. R. C. McCHORD, Lebanon.	
To expense as Councilor.	
Approved by the Council and ordered paid by the House of Delegates.	
October 1—Voucher Check No. 12.....	\$ 39 05
DR. D. M. GRIFFITH, Owensboro.	
To expense as Councilor.	
Approved by the Council and ordered paid by the House of Delegates.	
October 1—Voucher Check No. 13.....	\$224 00
S. W. BASSETT CO, Providence, R. I.	
To buttons and bangles.	
Approved by the Council and ordered paid by the House of Delegates.	
October 1—Voucher Check No. 14.....	\$150 00
C. T. DEARING PRINTING CO., Louisville.	
To 4500 Booklets.	
Approved by the Council and ordered paid by the House of Delegates.	
October 1—Voucher Check No. 15.....	\$ 60 00
MR. B. P. EUBANK, Bowling Green.	
To auditing books	\$ 50 00
To expense of trip	10 00
Approved by the Council and ordered paid by the House of Delegates.	
October 1—Voucher Check No. 16.....	\$ 2 00
E. H. ROEDERER, Louisville.	
To 5 ribbon badges at 40 cents each.	
Approved by the Council and ordered paid by the House of Delegates.	
October 1—Voucher Check No. 17.....	\$ 32 00
DR. E. N. HALL, Bowling Green.	
To expense to Lexington meeting.	
Approved by the Council and ordered paid by the House of Delegates.	
October 1—Voucher Check No. 18.....	\$ 17 00
DR. A. W. CAIN, Somerset.	
To expense to Lexington meeting.	
Approved by the Council and ordered paid by the House of Delegates.	
October 1—Voucher Check No. 19.....	\$ 45 11
MAYME SULLIVAN, Louisville.	
To expense at Lexington meeting	\$ 20 11
To Honorarium	25 00
Approved by the Council and ordered paid by the House of Delegates.	
October 1—Voucher Check No. 20.....	\$ 10 00
MARY ATKINS, Louisville.	
To Honorarium at Lexington meeting.	
Approved by the Council and ordered paid by the House of Delegates.	
October 1—Voucher Check No. 21.....	\$137 05
PHOENIX HOTEL CO., Lexington.	
To expense of Councilors and Officers attending Lexington Meeting.	
Approved by the Council and ordered paid by the House of Delegates.	
October 1—Voucher Check No. 22.....	\$388 00
TIMES-JOURNAL PUBLISHING CO., Bowling Green.	
To cash paid W. C. Morris, postage	\$ 12 00
To 2400 Sept 1st, 64-page JOURNAL	215 00
To difference cost of paper	87 50
To catalogue envelopes	12 75
To printing envelopes	2 40
To 20 per cent added	43 00
To 16 changes	3 20
To difference cost tabulated matter 6 point	24 65
By 50 typo. errors, 25 cents each	\$400 50
	12 50
	\$388 00
Approved by the Council and ordered paid by the House of Delegates.	
October 1—Voucher Check No. 23.....	\$128 42
DR. W. W. ANDERSON, Newport.	
To expenses at Lexington Meeting.	
Approved by the Council and ordered paid by the House of Delegates.	
October 1—Voucher Check No. 24.....	\$ 50 00
W. C. MORRIS, Bowling Green.	
To postage on JOURNALS.	
November 1—Voucher Check No. 25.....	\$150 00
DR. A. T. McCORMACK, Louisville.	
To October salary as Secretary.	
November 1—Voucher Check No. 26.....	\$ 50 00
DR. L. H. SOUTH, Louisville.	
To October salary, Business Manager.	
November 1—Voucher Check No. 27.....	\$ 50 00
EDITH LANDRUM, Louisville	
To October salary, Bookkeeper.	
November 1—Voucher Check No. 28.....	\$ 8 00
DR. C. G. HOFFMAN, Louisville.	
To expenses as Councilor	
Approved by the Council and ordered paid by the House of Delegates.	
November 1—Voucher Check No. 29.....	\$ 59 23
DR. J. S. LOCK, Louisville.	
To expenses as Councilor	
Approved by the Council and ordered paid by the House of Delegates.	
November 1—Voucher Check No. 30.....	\$102 50
AMERICAN MEDICAL ASSOCIATION, Chicago.	
To 2500 duotones of photographs of Dr. W. W. Anderson.	
Approved by the Council and ordered paid by the House of Delegates.	

November 1—Voucher Check No. 31.	\$126 25
BINGHAM, TABB & LEVI.	
To Attorney fees.	
November 1—Voucher Check No. 32.	\$150 00
SAMPSON & SAMPSON, Louisville.	
To Attorney fees in case of Lizzie Rose vs. Dr. Arthur Jenkins.	
November 1—Voucher Check No. 33.	\$417 85
TIMES-JOURNAL PUBLISHING CO., Bowling Green.	
To October issue JOURNAL, 80 pages	\$250 00
To difference cost of paper	105 85
To 16 changes	3 20
To printing envelopes	2 30
To 20 per cent added	50 00
To 2000 catalogue envelopes	12 75
	\$424 10
Less 25 errors at 25 cents each	6 25
	\$417 85
November 1—Voucher Check No. 34.	\$ 40 55
DR. W. W. RICHMOND, Clinton.	
To expenses as Councilor.	
Approved by the Council and ordered paid by the House of Delegates.	
November 1—Voucher Check No. 35.	\$ 14 64
MAYME SULLIVAN, Louisville.	
To reimbursement for deposit made on stamped envelopes.	
November 1—Voucher Check No. 36.	\$120 00
E. T. SCHMITT, P. M., Louisville.	
To balance due on 6000 stamped envelopes.	
November 1—Voucher Check No. 37.	\$ 51 50
E. T. SCHMITT, P. M., Louisville.	
To 2500 No. 5 two-cent stamped envelopes.	
December 1—Voucher Check No. 38.	\$175 00
DR. A. T. McCORMACK, Louisville.	
To salary, Secretary	\$150 00
To expnse of S. M. Association	25 00
December 1—Voucher Check No. 39.	\$ 50 00
DR. L. H. SOUTH, Louisville.	
To salary, Business Manager.	
December 1—Voucher Check No. 40.	\$ 50 00
EDITH LANDRUM, Louisville	
To salary, Bookkeeper.	
December 1—Voucher Check No. 41.	\$404 00
WILLIAM WHITFORD, Chicago.	
To reporting and transcribing proceedings of House of Delegates. General session and Discussion.	
Approved by the Council and ordered paid by the House of Delegates.	
December 23—Voucher Check No. 42.	\$150 00
DR. A. T. McCORMACK, Louisville.	
To salary, Secretary.	
December 23—Voucher Check No. 43.	\$ 50 00
DR. L. H. SOUTH, Louisville.	
To salary, Business Manager.	
December 23—Voucher Check No. 44.	\$ 50 00
EDITH LANDRUM, Louisville	
To salary, Bookkeeper.	
December 23—Voucher Check No. 45.	\$ 18 39
BUSH-KREBS CO., Louisville.	
To pen drawing diagram	\$ 5 00
To 3 sp. H. T.'s Ills., of Man	13 39
December 23—Voucher Check No. 46.	\$ 12 50
AMERICAN SECURITY CO., OF NEW YORK.	
To Official Bond Premiums for Dr. W. B. McClure, Treasurer.	
December 23—Voucher Check No. 47.	\$ 50 00
FRED FORCHT, Attorney.	
To services rendered in the Payne Medicine Co.	
December 23—Voucher Check No. 48.	\$603 06
TIMES-JOURNAL PUBLISHING CO., Bowling Green.	
Nov. 3—To 500 Letter Heads and 500 Envelopes C. B. G.	\$ 6 50
To 500 Letter Heads and 500 Envelopes C. Lexington	6 50
To 500 Letter Heads and 500 Envelopes C. Cynthia	6 50
To 500 Letter Heads and 500 Envelopes C. Somerset	6 50
To 500 Letter Heads and 500 Envelopes C. Catlettsburg	6 50
To 500 Letter Heads and 500 Envelopes President, Newport	6 50
To 500 Letter Heads and 500 Envelopes Chrm. C., Lebanon	6 50
To 500 Letter Heads and 500 Envelopes C. Louisville	6 50
To 500 Letter Heads and 500 Envelopes C. Louisville	6 50
To 500 Letter Heads and 500 Envelopes C. Louisville	6 50
To 500 Letter Heads and 500 Envelopes Medico-Legal	6 50
To 250 Letter Heads and 250 Envelopes Hds. C.	4 25
To 250 Letter Heads and 250 Envelopes Hds. C.	4 25
To 250 Letter Heads and 250 Envelopes Hds. C.	4 25
To 250 Letter Heads and 250 Envelopes Vice Pres., L.	4 25
To 250 Letter Heads and 250 Envelopes Vice Pres., Berea	4 25
To 250 Letter Heads and 250 Envelopes Vice Pres., Paducah	4 25
To 1000 Letter Heads and 1000 Envelopes Treasurer.	10 50
To 10000 Letter Heads for Secretary	45 00
To postage	2 56
To November issue JOURNAL	300 00
To difference cost of paper	127 05
To printing envelopes	2 30
To 7 changes	1 40

To envelopes	12 75	
To 20 per cent added	60 00	
		\$658 56
By deduction by delay	\$50 00	
By 22 errors at 25 cents	5 50	55 50
		\$603 06
January 31—Voucher Check No. 49.....		\$150 00
DR. A. T. McCORMACK, Louisville.		
To salary, Secretary.		
January 31—Voucher Check No. 50.....		\$ 50 00
DR. L. H. SOUTH, Louisville.		
To salary, Business Manager.		
January 31—Voucher Check No. 51.....		\$ 50 00
EDITH LANDRUM, Louisville		
To salary, Bookkeeper.		
January 31—Voucher Check No. 52.....		\$ 25 00
W. C. MORRIS, P. M., Bowling Green.		
To postage on JOURNALS.		
January 31—Voucher Check No. 53.....		\$250 00
J. J. GREENLEAF, Attorney.		
To Attorney fee in case of Dr. R. H. Cowley.		
January 31—Voucher Check No. 54.....		\$ 4 50
DR. S. J. SMOCK.		
To reimburse for dues.		
January 31—Voucher Check No. 55.....		\$102 50
FRED FORCHT, Attorney.		
To Attorney fee in case of Rosa Beghtol vs. Dr. Sam S. Foss.		
January 31—Voucher Check No. 56.....		\$ 16 20
FRED FORCHT, Attorney.		
To report of evidence for Defendant and depositions of Pety for Dept. in case of Rosa Beghtol vs. Dr. S. S. Foss.		
January 31—Voucher Check No. 57.....		\$ 3 25
JNO. P. MORTON & CO.		
To 1 book for office.		
January 31—Voucher Check No. 58.....		\$698 55
TIMES-JOURNAL PUBLISHING CO., Bowling Green.		
Jan. 1—To Dec. issue 100-page JOURNAL	\$310 00	
To difference cost of paper	108 00	
To catalogue envelopes	12 75	
To printing envelopes	2 20	
To 20 per cent added	62 00	
To 21 changes	4 20	
To difference setting index 6 pt type	12 85	
To Jan. issue, 64-page JOURNAL	210 00	
To difference cost of paper	72 00	
To 20 per cent added	42 00	
To 8 changes	1 60	
To printing envelopes	2 20	
To catalogue envelopes	12 75	
		\$852 55
By Dec. deduction by delay	\$100 00	
By Dec. deduction for errors.....	2 25	
By Jan. deduction by delay	50 00	
By Jan. deduction for errors	1 75	154 00
		\$698 55
March 1—Voucher Check No. 59.....		\$150 00
DR. A. T. McCORMACK, Louisville.		
To salary as Secretary.		
March 1—Voucher Check No. 60.....		\$ 50 00
DR. L. H. SOUTH, Louisville.		
To salary as Business Manager.		
March 1—Voucher Check No. 61.....		\$ 50 00
EDITH LANDRUM, Louisville		
To salary as Bookkeeper.		
March 1—Voucher Check No. 62.....		\$ 38 66
BUSH & KREBS CO., Louisville.		
To 7 sq. H. T. Medical Subjects	\$ 30 31	
To 1 sq. H. T. Blind lady	4 09	
To 1 sq. H. T. Man	4 26	
March 1—Voucher Check No. 63.....		\$150 00
FRED FORCHT, Attorney, Louisville.		
To services from July 1st, 1920, to Jan. 1st, 1921.		
March 1—Voucher Check No. 64.....		\$ 12 25
FRED FORCHT, Attorney, Louisville.		
To balance of fees in case of Rosa Beghtol vs. Dr. S. S. Foss.		
April 1—Voucher Check No. 65.....		\$150 00
DR. A. T. McCORMACK, Louisville.		
To salary as Secretary.		
April 1—Voucher Check No. 66.....		\$ 50 00
DR. L. H. SOUTH, Louisville.		
To salary as Business Manager.		
April 1—Voucher Check No. 67.....		\$ 50 00
EDITH LANDRUM, Louisville		
To salary as Bookkeeper.		
April 1—Voucher Check No. 68.....		\$150 00
CHAS. C. BOLDERICK & W. H. SPRAGENS, Attorneys.		
To Attorney's fees in case of Ernest Knopp vs. Dr. G. G. Thornton.		

April 1—Voucher Check No. 69.....	\$ 7 25
BOOK SHOP BINDERY, Chicago.	
To binding A. M. A. Journals	\$ 5 00
To binding K. M. Journals	2 25
April 1—Voucher Check No. 70.....	\$ 5 00
BUSH & KREBS, Louisville.	
To one zinc diagram.	
April 1—Voucher Check No. 71.....	\$ 2 70
THE ART SHOP, Louisville.	
To framing picture of Ex-President.	
April 1—Voucher Check No. 72.....	\$1235 25
TIMES-JOURNAL PUBLISHING CO., Bowling Green.	
To 2200 80-page issue February	\$260 00
To difference in cost of paper	92 00
To 20 per cent added	52 00
To printing envelopes	2 20
To 10 changes	2 00
To envelopes	10 75
To 2200 March JOURNALS, 96-page	300 00
To difference in cost of paper	104 00
To 20 per cent added	60 00
To printing envelopes	2 20
To 6 changes	1 20
To envelopes	10 75
To 2000 bill heads	6 00
To 2200 April issue, 100 pages	310 00
To difference in cost of paper	102 80
To envelopes	10 75
To 20 per cent added	62 00
To 22 changes	4 40
To printing envelopes	2 20
	\$1395 25
Less for delay in February	\$ 70 00
Less for errors in February	2 75
Less for delay in March	50 00
Less for errors in March	3 00
Less for delay in April	30 00
Less for errors in April	4 25
	160 00
	\$1235 25
May 1—Voucher Check No. 73.....	\$150 00
DR. A. T. McCORMACK, Louisville.	
To salary as Secretary.	
May 1—Voucher Check No. 74.....	\$ 52 40
DR. L. H. SOUTH, Louisville.	
To salary as Business Manager.	
May 1—Voucher Check No. 75.....	\$ 50 00
EDITH LANDRUM, Louisville	
To salary as Bookkeeper.	
May 1—Voucher Check No. 76.....	\$ 8 00
DR. S. B. MARKS, Secretary Fayette County.	
To reimburse for overpaid dues.	
May 1—Voucher Check No. 77.....	\$ 76 45
BUSH & KREBS, Louisville	
To grouping three groups	\$ 9 00
To 2 sq. H. T. Medical Pictures	22 20
To 8 sq. H. T. Portraits	33 41
To 1 sq. H. T. Portrait	4 09
To 1 sq. H. T. Medical Pictures	7 75
June 1—Voucher Check No. 78.....	\$164 85
DR. A. T. McCORMACK, Louisville.	
To salary as Secretary	\$150 00
To expenses to Paducah	14 85
June 1—Voucher Check No. 79.....	\$ 77 65
DR. L. H. SOUTH, Louisville.	
To salary as Business Manager	\$ 50 00
To expenses to Dauville and Bloomfield.	27 65
June 1—Voucher Check No. 80.....	\$ 50 00
EDITH LANDRUM, Louisville	
To salary as Bookkeeper.	
June 1—Voucher Check No. 81.....	\$ 3 25
KOELHER STAMP AND STENCIL CO.	
To rubber stamps for Dr. J. A. Stucky.	
June 1—Voucher Check No. 82.....	\$ 1 00
DR. J. F. DAUGHERTY.	
To reimburse for overpaid dues.	
June 1—Voucher Check No. 83.....	\$ 1 00
DR. C. J. LOCKHART.	
To reimburse for overpaid dues.	
June 1—Voucher Check No. 84.....	\$ 1 00
DR. A. P. HUNT.	
To reimburse for overpaid dues.	
July 1—Voucher Check No. 85.....	\$150 00
DR. A. T. McCORMACK, Louisville.	
To salary as Secretary.	
July 1—Voucher Check No. 86.....	\$ 50 00
DR. L. H. SOUTH, Louisville.	
To salary as Business Manager.	
July 1—Voucher Check No. 87.....	\$ 50 00
EDITH LANDRUM, Louisville	
To salary as Bookkeeper.	

July 1—Voucher Check No. 88.....	\$ 50 00
W. C. MORRIS, P. M., Bowling Green.	
To postage on JOURNALS.....	
July 1—Voucher Check No. 89.....	\$ 49 00
BUSH & KREBS, Louisville.	
To 11 sq. H. T. Illustrations.....	
July 1—Voucher Check No. 90.....	\$250 00
FORD & FORD, Attorneys, Georgetown.	
To attorneys fee in case of F. M. Bates vs. Dr. J. W. Baird.....	
July 1—Voucher Check No. 91.....	\$1020 65
TIMES-JOURNAL PUBLISHING CO., Bowling Green.	
To 3000 16-page reprints, J. Moren	\$ 57 00
To May issue, 112-pages, 2200	340 00
To 20 per cent added	68 00
To extra cost of paper	105 40
To catalogue envelopes	11 50
To 23 changes	4 60
To printing envelopes	2 20
To 250 floor plans	2 75
To exhibit blanks	3 75
To applications for space	4 75
To 2200 June issues, 112 pages	340 00
To 20 per cent added	68 00
To extra cost of paper	105 40
To catalogue envelopes	11 50
To 18 changes	3 60
To printing envelopes	2 20
	1130 65
Less delay in printing	\$100 00
Less errors	10 00
	110 00
	\$1020 65
July 1—Voucher Check No. 92.....	\$11 00
UNIVERSITY BOOK STORE, Lexington.	
Stationery for Dr. W. B. McClure, Treasurer.	
To 500 sheets paper	\$ 5 50
To 500 envelopes	5 50
August 1—Voucher Check No. 93.....	\$150 00
DR. A. T. McCORMACK, Louisville.	
To salary as Secretary.....	
August 1—Voucher Check No. 94.....	\$ 50 00
DR. L. H. SOUTH, Louisville.	
To salary as Business Manager.....	
August 1—Voucher Check No. 95	\$ 50 00
EDITH LANDRUM, Louisville	
To salary as Bookkeeper.....	
August 1—Voucher Check No. 96.....	\$ 25 95
BUSH & KREBS CO., Louisville,	
To 2 sq. H. T. Medical Views	\$ 7 75
To 1 sq. H. T. Boy	4 44
To 1 sq. H. T. X-ray Body	13 76
August 1—Voucher Check No. 97.....	\$ 40 00
AMERICAN MEDICAL ASSOCIATION, Chicago.	
To 2500 Duotones of Dr. J. A. Stucky.....	
August 1—Voucher Check No. 98.....	\$485 90
TIMES-JOURNAL PUBLISHING CO., Bowling Green.	
To 2200 100-page July issue	\$310 00
To difference cost of paper	95 20
To 20 per cent added	62 00
To envelopes	11 50
To 25 changes	5 00
To printing envelopes	2 20
September 1—Voucher Check No. 99.....	\$150 00
DR. A. T. McCORMACK, Louisville.	
To salary as Secretary.....	
September 1—Voucher Check No. 100.....	\$ 50 00
DR. L. H. SOUTH, Louisville.	
To salary as Business Manager.....	
September 1—Voucher Check No. 101.....	\$ 50 00
EDITH LANDRUM, Louisville	
To salary as Bookkeeper.....	
TOTAL	\$12277 76

EXHIBIT "B."		DISBURSEMENTS	
RECEIPTS AND DISBURSEMENTS		STATE MEDICAL ASSOCIATION:	
Dues from County Societies and		Secretary's Salary	\$ 1800 00
Income of JOURNAL (exclusive		Secretary's Stenographer	600 00
of investments, etc.).....	\$6038 04	Secretary's stamps and envelopes	231 14
Subscriptions to JOURNAL	7546 50	Treasurer's office expense and	
Interest on Investments, viz:		bond	12 50
Interest on Liberty Bond No. 1	85 00	Officers, Councilor and Committee	
Interest on Liberty Bond No. 2	42 50	expenses	459 21
	s	Attorney's Fee, Medico-Legal	
Total receipts	\$ 13712 04	Committee	938 50
Balance on hand September 1, 1920.....	6190 85	Cost and Expenses	318 70
Total	\$ 19902 89	Association Sundries	352 20
		Expenses of Lexington Meeting..	1032 16
		Expenses of Delegates to National	
		Convention	62 00
		Total State Medical Association.....	\$ 5806 41

KENTUCKY MEDICAL JOURNAL:	
Business Manager's Salary.....	\$ 600 00
Printing JOURNAL	3086 75
Postage on JOURNAL	169 90
Cost of Paper	1341 05
JOURNAL Sundries	1055 75
Treasurer's Sundries	29 00
Secretary's Sundries	39 85
Business Manager's Sundries....	40 05
President's Sundries	109 00

Total JOURNAL	\$ 6471 35
Grand Total	\$12277 76
Balance on hand this date	7625 13
Total	\$19902 89

EXHIBIT "C."

Detailed list of receipts from County Societies from September 1920, to September 1, 1921, compared with incomes of same period last year.

	1920	1921
Adair	\$ 66 00	\$ 32 00
Allen	51 00	52 00
Anderson	27 00	48 00
Ballard	42 00	48 00
Barren	57 00	48 00
Bath	27 00	46 00
Bell	87 00	118 00
Boone	48 50	18 00
Bourbon	75 00	90 00
Boyd	112 00	154 00
Boyle	42 00	56 00
Bracken	18 00	30 00
Breathitt	27 00	43 00
Breckenridge	45 00	72 00
Bullitt	28 00	36 00
Butler	9 00	24 00
Caldwell	42 50	48 00
Calloway	50 00	48 00
Campbell-Kenton	445 00	426 00
Carlisle	30 00	40 00
Carroll	27 00	32 00
Carter	49 50	39 00
Casey	21 00	20 00
Christian	138 00	144 00
Clark	89 00	52 00
Clay	28 00	32 00
Clinton	15 00	20 00
Crittenden	27 00	35 00
Cumberland	27 00	40 00
Daviess	165 50	204 00
Elliott	9 00	7 00
Estill	9 50	10 00
Fayette	230 00	330 00
Fleming	42 00	60 00
Floyd	33 00	4 00
Franklin	63 00	83 00
Fulton	63 00	56 00
Gallatin	21 25	16 00
Garrard	30 00	32 00
Grant	48 00	56 00
Graves	96 00	120 00
Grayson	57 00	55 50
Green	27 00	16 00
Greenup	24 00	17 00
Hancock	3 50	4 00
Hardin	81 00	88 00
Harlan	66 00	105 00
Hart	39 00	56 00
Harrison	72 00	88 00
Henderson	102 00	95 00
Henry	51 00	56 00
Hickman	39 00	52 00
Hopkins	114 00	92 00
Jackson	15 00	20 00
Jefferson	1097 00	1227 00
Jessamine	30 00	40 00
Johnson	54 00	44 00
Knott	8 50	0 00
Knox	39 00	44 00
Larue	24 00	36 00
Laurel	33 00	36 00
Lawrence	42 00	48 00
Lee	15 00	20 00
Leslie	11 50	8 00
Letcher	51 00	52 00
Lewis	30 00	35 00
Lincoln	51 00	56 00
Livingston	33 00	44 00
Logan	75 00	79 00
Lyon	18 00	24 00
McCracken	145 00	167 00
McCreary	18 00	24 00

McLean	27 00	24 00
Madison	87 00	124 00
Magoffin	21 00	0 00
Marion	54 00	64 00
Marshall	63 00	64 00
Martin	0 00	0 00
Mason	57 00	56 00
Meade	17 50	20 00
Menifee	0 00	0 00
Mercer	75 00	76 00
Metcalfe	27 00	36 00
Monroe	27 00	32 00
Montgomery	54 00	56 00
Morgan	9 00	4 00
Muhlenberg	78 00	100 00
Nelson	48 00	60 00
Nicholas	48 00	40 00
Ohio	30 00	38 00
Oldham	42 50	56 00
Owen	21 00	28 00
Owsley	12 00	16 00
Pendleton	32 00	36 00
Perry	69 00	60 00
Pike	69 00	40 00
Powell	15 00	19 00
Pulaski	39 00	52 00
Robertson	7 00	21 00
Rockcastle	21 00	28 00
Rowan	15 00	8 00
Russell	27 00	40 00
Scott	63 00	76 00
Shelby	63 00	87 00
Simpson	21 50	52 00
Spencer	9 00	8 00
Taylor	30 00	40 00
Todd	51 00	56 00
Trigg	9 00	4 00
Trimble	3 00	16 00
Union	53 00	39 00
Warren	119 00	151 00
Washington	36 00	36 00
Wayne	21 00	24 00
Webster	15 00	12 00
Whitley	72 00	102 00
Wolfe	0 00	4 00
Woodford	30 00	44 00

EXHIBIT "D."

Invoice of the property of the Association, September 1, 1921.

Addressograph with 5000 complete addressed plates with list device, etc	\$ 600 00
Folding Machine	140 00
1 Underwood Typewriter	100 00
1 Desk	79 00
Filing Cabinet	64 75
Rubber Stamps	9 00
Typewriter Cabinet	33 00
Guide Cards	7 48
1-3 Adding Machine	106 25
Typewriter Chair	9 00
1 Electric Fan	18 00
1 Desk Chair	32 50
1 Globe Safe with Fixtures	130 00
1000 No. 5, 2-cent Stamped Envelopes	21 25
1000 No. 7, 2-cent Stamped Envelopes	22 50
500 No. 9, 2-cent Stamped Envelopes	13 41
Total	\$1386 14
Reduction for depreciation in machinery	538 75
	\$ 847 39

EXHIBIT "E."

Secretary's Monthly Balance Sheet, agreeing with books.

Sept. 1.—The balance on hand Sept. 1, 1920			\$6190 85
1921	Expenses	Collections	Balance
September 25		\$ 644 63	\$6855 48
October 10	\$2545 08	516 14	4806 54
November 1	1340 52	303 07	3769 09
December 1	679 00	777 94	3868 03
December 30	933 95	407 29	3341 37
January 31	1350 00	1477 28	3468 65
March 1	450 91	2148 72	5166 46
April 1	1650 20	2370 94	5887 20
May 1	346 85	2302 19	7842 54
June 1	298 75	1259 80	8803 59
July 1	1630 65	548 05	7720 93

August 1	801 85	955 99	7875 13
August 31	250 00		7625 13
	\$12277 76	\$13712 04	
Bal on hand Sept. 1, 1920		6190 85	
		\$19902 89	
Balance on hand Sept 1, 1921			\$ 7625 13
Total expenses			12277 76
			\$19902 89

EXHIBIT "F."

Collections by Secretary on account of Kentucky State Medical Association, corresponding with checks, deposit slips, and receipts, filed herewith:

1920-1921	
September 10—To collection to date	\$ 180 00
November 1—To collection to date	12 00
November 30—To collection to date	13 00
December 23—To collection to date	12 00
February 2—To collection to date	1018 00
March 1—To collection to date	1415 00
April 1—To collection to date	1793 00
May 1—To collection to date	1837 00
June 1—To collection to date	912 00
July 1—To collection to date	199 50
August 1—To collection to date	155 00
Total for year	\$7546 50

EXHIBIT "G."

Collections by Editor on account of the JOURNAL, corresponding with checks, deposit slips, and receipts filed herewith:

1920-1921	
September 10—To collection to date	\$ 980 77
November 1—To collection to date	291 07
November 30—To collection to date	764 94
December 23—To collection to date	395 29
February 2—To collection to date	459 28
March 1—To collection to date	733 72
April 1—To collection to date	577 94
May 1—To collection to date	465 19
June 1—To collection to date	347 80
July 1—To collection to date	348 55
August 1—To collection to date	800 99
Total for year	\$6165 54

EXHIBIT "H."

Total membership by Councilor Districts and by Counties for 1921 as compared to that of 1920.

FIRST DISTRICT		1920	1921
Ballard		14	12
Caldwell		13	12
Calloway		16	12
Carlisle		10	10
Fulton		21	14
Graves		12	30
Hickman		11	13
Livingston		11	11
Lyon		6	6
Marshall		19	16
McCracken		42	41
Trigg		1	1
		176	178
SECOND DISTRICT		1920	1921
Breckenridge		15	18
Crittenden		9	9
Daviess		53	50
Hancock		1	1
Henderson		28	22
Hopkins		30	23
McLean		7	6
Muhlenberg		24	25
Ohio		10	8
Union		18	10
Webster		4	3
		199	175

THIRD DISTRICT		1920	1921
Allen		16	13
Barren		18	12
Butler		3	5
Christian		41	36
Cumberland		9	10
Logan		25	19
Metcalfe		9	9
Monroe		9	8
Simpson		6	13
Todd		14	14
Warren-Edmonson		31	37
		181	176

FOURTH DISTRICT		1920	1921
Bullitt		9	9
Grayson		16	14
Hardin		26	22
Hart		9	14
Henry		16	14
Larue		8	9
Meade		6	5
Nelson		16	15
Oldham		13	14
Shelby		29	21
		139	137

FIFTH DISTRICT		1920	1921
Anderson		9	12
Boone		8	5
Carroll		8	8
Franklin		15	20
Gallatin		6	4
Jefferson		318	304
Owen		5	7
Spencer		1	2
Trimble		1	4
		371	366

SIXTH DISTRICT		1920	1921
Adair		11	8
Boyle		13	14
Green		7	4
Marion		18	16
Mercer		21	19
Taylor		10	10
Washington		10	9
		90	80

SEVENTH DISTRICT		1920	1921
Casey		6	5
Clinton		5	5
Garrard		10	8
Lincoln		14	14
McCreary		6	6
Pulaski		11	13
Rockcastle		6	7
Russell		9	10
Wayne		7	6
		74	74

EIGHTH DISTRICT		1920	1921
Bourbon		21	21
Bracken		5	6
Campbell-Kenton		87	87
Fleming		14	15
Grant		15	14
Harrison		22	22
Jessamine		10	10
Mason		15	12
Nicholas		15	10
Pendleton		10	9
Robertson		0	3
Scott		20	19
Woodford		10	8
		244	236

NINTH DISTRICT		1920	1921
Floyd		5	1
Boyd		31	38
Carter		14	9
Elliott		2	2
Greenup		6	4
Johnson		14	11
Lawrence		14	12
Lewis		9	9
Magoffin		7	0
Pike		17	10
		119	96

TENTH DISTRICT

	1920	1921
Bath	8	10
Breathitt	9	11
Clark	26	13
Estill	3	3
Fayette	74	80
Knott	1	0
Lee	4	5
Letcher	16	13
Madison	29	30
Menifce	0	0
Montgomery	17	14
Morgan	2	1
Owsley	4	4
Perry	17	15
Powell	1	4
Rowan	3	2
Wolfe	0	2
	217	207

ELEVENTH DISTRICT

	1920	1921
Bell	27	28
Clay	8	8
Harlan	18	24
Jackson	5	5
Knox	13	11
Laurel	9	9
Leslie	3	2
Whitley	24	24
	107	111

OFFICIAL CALL.

THE SEVENTY-FIRST ANNUAL MEETING OF THE
KENTUCKY STATE MEDICAL ASSOCIATION
TO BE HELD IN LOUISVILLE, SEPTEMBER
19, 20, 21, AND 22, 1921.

To the Officers and Members of the Component County Societies of the Kentucky State Medical Association:

The Seventy-first Annual Meeting of the Kentucky State Medical Association will convene in the Auditorium of the Seelbach Hotel, Louisville, on Monday, Tuesday, Wednesday and Thursday, September 19, 20, 21 and 22, 1921.

THE HOUSE OF DELEGATES

The House of Delegates of the Kentucky State Medical Association will convene in the Leather Room of the Seelbach Hotel, Louisville, at 2 P. M., on Monday, September 19, 1921.

FIRST GENERAL SESSION

The First General Session, which constitutes the opening exercises of the scientific functions of the Association, will be held in the Auditorium, Seelbach Hotel, Louisville, at 9 A. M., Tuesday, September 20, 1921.

THE COUNCIL

The Council will convene at the office of the Kentucky State Medical Association, Sixth and Main streets, Louisville, on Monday, September 19, at 10:30 A. M.

THE REGISTRATION DEPARTMENT

The Registration Department will be opened in the Exhibit Hall, Seelbach Hotel, Louisville, from 10 A. M. to 6 P. M. on Monday, September 19th, 1921; from 8 A. M. to 6 P.

M. Tuesday and Wednesday, September 20 and 21, and from 8 A. M. to 11:30 A. M. on Thursday, September 22nd.

COUNCILOR DISTRICTS

FIRST DISTRICT.

BALLARD	FULTON	LYON
CALDWELL	GRAVES	MARSHALL
CALLOWAY	HICKMAN	MCCRACKEN
CARLISLE	LIVINGSTON	TRIGG

SECOND DISTRICT.

BRECKINRIDGE	HENDERSON	OHIO
CRITTENDEN	HOPKINS	UNION
DAVIESS	MCLEAN	WEBSTER
HANCOCK	MUHLBURG	

THIRD DISTRICT.

ALLEN	CUMBERLAND	METCALFE
BARREN	HART	WARREN-EDMONSON
BUTLER	LOGAN	SIMPSON
CHRISTIAN	MONROE	TODD

FOURTH DISTRICT

BULLITT	HENRY	SHELBY
GRAYSON	LARUE	OLDHAM
HARDIN	MEADE	NELSON

FIFTH DISTRICT.

ANDERSON	FRANKLIN	OWEN
BOONE	GALLATIN	SPENCER
CARROLL	JEFFERSON	TRIMBLE

SIXTH DISTRICT.

ADAIR	GREEN	TAYLOR
BOYLE	MERCER	WASHINGTON
	MARION	TON

SEVENTH DISTRICT.

CASEY	LINCOLN	RUSSELL
CLINTON	PULASKI	WAYNE
GARRARD	ROCKCASTLE	MCCREARY

EIGHTH DISTRICT.

BOURBON	HARRISON	PENDLETON
BRACKEN	JESSAMINE	ROBERTSON
CAMPBELL-KENTON	MASON	SCOTT
FLEMING	NICHOLAS	WOODFORD
GRANT		

NINTH DISTRICT.

BOYD	GREENUP	MAGOFFIN
CARTER	JOHNSON	MARTIN
ELLIOTT	LEWIS	PIKE
FLOYD	LAWRENCE	

TENTH DISTRICT.

BATH	LEE	OWSLEY
BREATHITT	LETCHER	PERRY
CLARK	MADISON	POWELL
ESTILL	MENIFEE	ROWAN
FAYETTE	MONTGOMERY	WOLFE
KNOTT	MORGAN	

ELEVENTH DISTRICT.

BELL	JACKSON	LESLIE
CLAY	KNOX	WHITLEY
HARLAN	LAUREL	

THE COMMERCIAL EXHIBIT.

Horlick's Malted Milk Company, of Racine, Wisconsin, will occupy space No. 2, where they will exhibit "Horlick's" the ORIGINAL Malted Milk in powder and tablet forms, and other quality products, favorably known for their reliability and perfection of manufacture. Samples and literature will be distributed and your questions answered by the representative in charge. The attendance of all is cordially solicited.

While we will have the older Squibb products for display we will endeavor on this occasion to feature those newer preparations which we believe will be of more vital interest to the profession.

The unusual amount of publicity given to Thyroxin, in the symposium on Basal Metabolism, at the American Medical Association meeting in Boston will naturally cause us to feature Thyroxin, the active principles of the thyroid gland isolated by Kendall of the Mayo Foundation.

We will also endeavor to have a display case of the Squibb Arsphenamines and other products of value in the venereal campaign.

The Squibb biological products will of course be shown in toto, with such specialties as Thromboplastin, Bacillus Bulgaricus and the Allergens.

E. R. SQUIBB & SONS.

We will have on display a complete line of Surgical Instruments. Particular attention is called to the line of Imported articles that will be shown.

Also display a complete line of Leather Bags, Buggy Cases, as well as laboratory specialties.

THEO. TAFEL.

Our display will consist mainly of Surgical Instruments and General Sundries as used by the surgeon and physician and will include many designs and instruments which have not been on the American market since before the War, also many new designs recently received from Germany and Sweden which have not been shown before.

We will also show the new Lamb's Tonsillectomy Chair-Table which can be used for office treatment as well as tonsil work. This chair raises, revolves and lowers and is exceedingly popular.

Surgical Instruments. The majority of steel goods such as knives, haemostatic forceps, scissors, tonsil instruments and intricate surgical appliances are imported from Europe. The duty on this class of goods has been 20 per cent for some years, but the American Congress expects to increase this rate to 60 per cent. This will necessarily increase the price of Surgical Instruments in America, and hospitals contemplating the purchase of these goods should consider this matter.

We merely offer the above as a suggestion as we think there will be an advance of at least from 25 to 33 1-3 per cent on many small surgical goods.

Reports from Germany indicate that labor conditions are still deplorable and that taxes have been increased, and every foreign invoice received is higher than the previous one. We do not know where this advance will end.

The exchange is also likely to advance at any time and we think that in the near future when the duty will be changed from 20 to 60

per cent, the price of foreign made surgical instruments will be materially increased. Already many hospitals are flooding us with orders as they see the "handwriting on the wall."

THE MAX WOCHER & SONS CO.

Mellin's Food Company, Boston, Mass., will occupy spaces 22 and 23. Physicians who desire information relative to the composition of Mellin's Food and its application as a modifier of milk or who wish to take up the matter of the management of an infant's diet will have every opportunity, for representatives well qualified to discuss the subject will be present at every session of the meeting.

Thompson Plaster X-ray Co., of Leesburg, Va., will have two new X-ray transformers on exhibition; also their new Type treatment outfit with which one can do anything in treatment work from vibration to bloodless surgery.

Will also demonstrate the Morse Wave Generator that is attracting so much attention.

This will be the most complete exhibit that this company has ever had at the Kentucky meeting.

Sharp & Smith will have a complete display of surgical instruments, comprising the latest and most improved patterns. One of the new features will be a Welch-Allyn set for diagnosis, not only for specialists but for the general man as well.

The main features of our Exhibit at the coming meeting of the Kentucky Medical Association will be the Victor type of the Potter-Bucky Diaphragm, and the new Victor Kearsley Stabilizer.

The Victor Potter-Bucky Diaphragm embodies points of merit that make for the utmost in results and a careful inspection will surely prove interesting to the members of your Association.

The Victor Kearsley Stabilizer is truly one of the most serviceable devices offered to the Medical Profession for use in X-ray work. In fact, it is second in importance only to the Coolidge Tube. It is of interest to all users of Coolidge Tubes, as it holds the Tube current constant in spite of line fluctuations. In other words it insures the operator of the exact amount of X-ray desired over any period of time for the subject in hand.

It will truly be worth while for all physicians attending the meeting to carefully inspect this device because we know it is going to prove invaluable to the majority if not all of them.

VICTOR X-RAY CORPORATION.

At the Kentucky State Medical Association Convention Petri dishes will be exhibited, showing the growth of bacteria with production of acid on one-half of the plate and the failure of growth on the other half impregnated with 4 per cent Kolynos Dental Cream. Such experiments in vitro, together with others in vitro, amply substantiate all claims for keeping the mouth clean, wholesome and sanitary by using Kolynos Dental Cream.

The Chas. H. Phillips Chemical Co., New York and London, exhibiting as usual:

Phillips' Milk of Magnesia. The pure magnesium oxide hydrated. A simple, pleasant, powerful acid neutralizer and corrective.

Phillips' Digestible Cocoa. A delicious, highly nutritious food beverage, non-constipating and readily assimilable.

Booths Nos. 18 and 19 brings us to Colgate & Company, of New York City, an ethical business concern, established 1806, whose products have a world-wide reputation. It is well to examine carefully the goods they have especially for the profession.

Space No. 4. The Gilliland Laboratories, Inc., Ambler, Pa., will display a line of Biological Products. Let the Representatives of this firm explain about these Products and how they may be obtained at special prices through their County Distributing Stations.

At the Annual Meeting of the Kentucky State Medical Association, the H. A. Metz Laboratories, Inc., will exhibit Silver-Salvarsan which, after numerous clinical tests made by eminent syphilographers throughout the country has been found to be of merit as an antisypilitic. Members of the Laboratories' staff will be in attendance to explain and to demonstrate to those interested the technic of administration of the various members of the Salvarsans group.

Other preparations such as Novocain, Holo-cain, Orthoform, Parathesin, Pyramidon, Al-bargin, etc., will constitute part of the Metz exhibit.

Members of the State Society and their professional guests are invited to visit the Metz booth.

As usual G. H. Sherman, M. D., Bacteriological Laboratories of Detroit, Mich., will be among our exhibitors this year.

Dr. Sherman is a pioneer in making Stock and Autogenous Vaccines and is among our leaders as a Vaccine producer.

Realizing this moral obligation to the Doctor and the patients he is satisfied only with giving the profession the very best that is possible to produce.

ORIGINAL ARTICLES

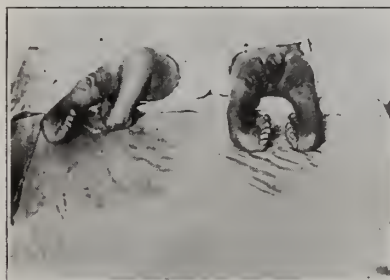
CONGENITAL CLUB FOOT.*

By WILLIAM BARNETT OWEN, Louisville.

There are about a dozen recognized varieties or combinations of the pedal deformity known as talipes or club foot, but in this paper only one will be discussed, viz., congenital talipes equinovarus. This is the most common form, being nearly four times as frequent as any of the other types. The deformity may be unilateral or bilateral and occurs approximately once in every one thousand births. The child may or may not be the subject of other anatomic developmental defects.

Congenital club foot is noted more frequently in males than in females in the proportion of about two to one, and the deformity is bilateral in more than fifty per cent. of instances. The right extremity is affected in about sixty per cent of the unilateral cases.

Bilateral club foot is noted with less fre-



Case 1—Before Operation

quency in multiple than in single gestations; the occurrence of double club foot in twins is exceedingly rare. One of the cases to be reported in this paper was of that type. Children with club foot are oftener born to multiparæ than primiparæ, but no reason can be assigned for the disproportion.

Numerous theories have been advanced in attempted explanation of the cause of congenital club foot, but records cited in substantiation are generally unconvincing. "Material impressions" and "hereditary influences" are usually blamed for anatomic pedal defects of development, some of which have been traced through three or four generations, but as it seems improbable that fetal development can be in the least altered by either factor, both hypotheses must be rejected as untenable. The same statement may be

*Read before the Kentucky State Medical Association. Lexington, September 27, 28, 29, 30, 1920.

applied to faulty implantation of the ovum, and to polyhydramnios, which have been prominently mentioned as causative factors.

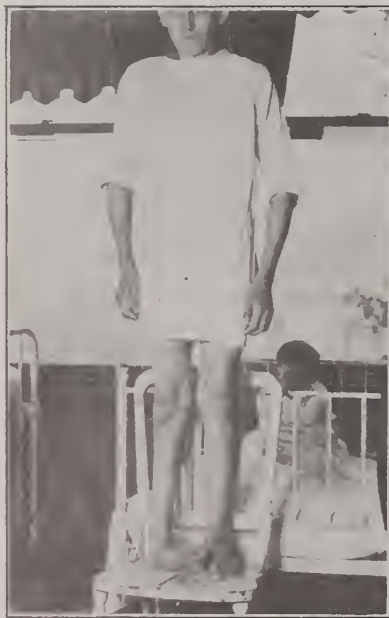
Oligohydramnios and fetal impaction in utero, especially when associated with mechanical factors such as uterine, intra-pelvic or intra-abdominal neoplasms, may exert suf-



Case 1—After Operation

ficient pressure upon the developing fetus to cause skeletal deformity of which club foot is merely a type.

Distortion of fetal extremities may occur from amniotic adhesions, even in the presence of a normal quantity of liquor amnii, and also



Case 2—Before Operation

from funic abnormalities. Undue pressure upon the fetus in utero entailed by unnatural positions enforced by occupational duties of the mother may be a factor in the production of club foot. In my opinion the determining cause is always mechanical in character.

In congenital talipes equinovarus the affected foot assumes an attitude of plantar flexion, adduction, and supination. The dorsum

is distorted forward, outward, and upward; the plantar surface shows abnormal concavity, and is distorted backward, inward, and downward. The foot seems smaller than normal with the heel imperfectly formed. The astragalus, os calcis and external malleolus are unduly prominent, whereas the internal malleolus appears more deeply situated than normal. The size, shape and relationship of the osseous structures of the foot and ankle may become altered if the distortion be not promptly overcome, and later the leg bones may also participate in the deformity. The ligaments necessarily undergo alteration in consonance with changes in osseous relations. The muscular tissues may remain normal as to origin and attachment, but undergo change in direction, and function because of the ex-



Case 2—After Operation

isting osseous abnormality with subsequent atrophy. The muscles of the inverted side are shorter and stronger than normal, whereas the converse is true of those of the outer aspect of the foot and leg. Thus practically all the structures of the foot participate in the deformity, especially as regards their position and relationship to each other.

In the absence of adequate early treatment, the prognosis in every type of congenital club foot is unfavorable. When treated by those unfamiliar with such cases the prognosis is also discouraging, recurrence of the deformity, or partial correction with persistence of functional disability, representing the logical outcome.

There are two methods of treatment either

of which may be successful, viz: (a) manipulative, and (b) operative. In the hands of adequately trained orthopedists correction by early manipulative methods is productive of satisfactory functional and cosmetic results in practically every instance provided treatment be instituted sufficiently early.

In this connection I wish to protest against the advice given by the majority of medical practitioners, i.e., to wait until the child has attained the age of five or six years before beginning the treatment. When the child has reached that age a surgical operation will be necessary to correct the deformity, whereas if seen during the first few days or weeks of life, manipulative methods will usually suffice. Therefore, it is of the utmost importance when a child has club foot that a competent orthopedist be called early in consultation. There is no excuse for delay in treatment.

Forcible reduction of the deformity by means of osteoclasis, wrenches, and other destructive mechanical devices, should be condemned as unjustifiable. Minor surgical measures are indicated where the deformity has remained untreated until the patient is two or three years old. These consist in subcutaneous tenotomy, fasciotomy, tarsetomy, partial astragalectomy, and division of the

must be maintained until the structures have become permanently readjusted to prevent recurrence. Repeated manipulation may be re-



Case 3—After Operation



Case 3—Before Operation

tendo achilles where required to produce and maintain necessary over-correction.

In the young child reduction of the deformity is easily accomplished by manipulative treatment on account of the extreme plasticity of the pedal tissues, and over-correction

quired to gradually stretch the contracted tissues and be certain of their maintenance in proper position. There being no destruction of tissue by this method of treatment, there is nothing to interfere with restoration of normal contour, strength, balance and function of the foot.

The process of proper walking is usually sufficient to prevent recurrence. The patient should never be allowed to walk with the foot in a distorted attitude because of the increase in distortion incident to body weight. Congenital club foot treated by repeated forcible stretching must be over-corrected to the extent of previous deformity in order to have the pendulum fall in the midline of balance. The tendency to recurrence cannot be too strongly emphasized.

Case 1. Twin boys, bilateral congenital club foot (talipes equinovarus). No history of deformity on either side of the family. Treatment was begun at four weeks of age; forcible stretching by manual manipulation followed by retention dressing; the procedure was repeated every fifth day until over-cor-

rection equaled previous deformity. This was followed by daily massage and manipulation by the parents and use of a convalescent brace



Case 4—Before Operation

and two sisters normal. No treatment prior to June 1st, 1920, at which time modified Cook operation was performed and plaster dressing applied to maintain over-correction. When this was removed two months later



Case 4—Before Operation

(August 1st), the wound had completely healed with the foot in good position. The patient walked within three weeks. A light ankle support and laced shoe then applied.

Correction perfect; no further treatment required.

Case 3. R. W., male, aged six years, bilateral congenital talipes equinovarus. No other until the children began walking with defect completely corrected. The result was perfect.

Case 2. F. B., male, aged thirteen years, high unilateral congenital talipes equinovarus. No other deformities in family; one brother deformities in the family; two other children normal. No treatment prior to modified Cook operation June 18th, 1920. Plaster retention dressing applied. The patient walked within three weeks; dressing removed in six weeks and corset shoe applied. Function satisfactory; no further treatment indicated.

Case 4. L. B., female, aged twenty-two years, light unilateral congenital talipes equinovarus;



Case 4—After Operation

only child. No history of other deformities in the family. No treatment until modified Cook operation October 4th, 1916. Plaster dressing applied and patient began walking within four weeks. Dressing removed in six weeks; it was then reapplied and allowed to remain for three weeks at the end of which time light ankle support and laced shoe applied. Further treatment unnecessary.

In operative treatment a sufficient outside wedge should be removed to allow the foot to be placed at right angles to the leg and parallel to opposite foot without undue force, otherwise there will be a tendency to recurrence. As the diagnosis in all cases is self-evident, the only question is early correction and proper maintenance.

In closing I cannot too strongly emphasize the importance of early treatment in these cases. If proper manipulative measures are employed sufficiently early will seldom be necessary to resort to open operation.

DISCUSSION

J. G. Carpenter, Stanford: I am very proud of the essayist and his paper. He told the truth all along the line. When you start right, you will go right, and live right, end right. In the past, general practitioners when confronted with deformities of the feet have said, "Wait; let the patient outgrow it." In a few years the patient has to land in the hands of an orthopedic or general surgeon and may come through all right. In cases of talipes, the treatment should be begun the first thirty-six or forty-eight hours after birth, with massage and manipulation, correction of the foot with elastic supporters, proper bandaging, etc., and it is surprising how fast these patients improve. I have had a number of them where I have been called in consultation by doctors, and they have told the family to let these little patients alone, that they would outgrow the deformity. If the general practitioner does not arrest the condition at the earliest possible date, the surgeon will have to do it later on. We must commence treatment early and have the family use friction and overcorrect the condition every day or every other day, as the case may be, and with a piece of rubber tube fasten to the deformed member. You can make the proper amount of traction and draw the foot out as you want to. If you wait for months before treating the deformity, you may have to resort to brisement force, and you do that under anesthesia. If it is necessary you can use a plaster dressing or a starch dressing and the patient will recover. Of all surgery I have done, I believe I have derived more gratification from my orthopedic surgical work than any other. By treating these hideous deformities at the right time you can make new people out of these unfortunate patients. Fellow doctors, begin treatment at once while time is called today—the first 24 hours. You have no right to neglect the curative treatment of these little deformed babies. They will soon be men and women and should be prepared and cured to be bread winners. The doctor who neglects the treatment of these deformities is guilty of mal-practice. In this enlightened day ignorance is a crime—a disgraceful crime.

Arthur T. McCormack, Louisville: I want to emphasize the importance, as Dr. Owen and Dr. Carpenter have, of early treatment of these cases. These deformities should be treated promptly and properly. In Kentucky there are four thousand cripples at the present time that need to be so repaired that they can earn a living, that they may be able to functionate properly. It is not right that this state, which is one of a few states, should have no place or no great institution where these cases can be brought. It is not a square deal when the burden should be placed on industrious and self-sacrificing men

like Dr. Owen to carry on this work without any other remuneration than the good done by their work. This matter of correction of deformities should be undertaken by the people of Kentucky in a state institution for that purpose. It is not a square deal to call upon a man like Dr. Owen to treat these cases without giving him an opportunity to do it in the big, constructive way that he is capable of doing it. The profession should understand that and help to educate the lawmakers that the time will soon come when we must have, through the gift of philanthropic citizens, some institution where this great work can be done properly and well.

W. B. Owen (closing the discussion): I thoroughly appreciate the interest and co-operation of Dr. McCormack.

Kentucky is backward in the care of cripples; especially indigent crippled children. There are about 4,000 in Kentucky for which there is absolutely no provision.

It is the duty of the medical profession to call attention of the foregoing fact to the proper authorities.

There is six times as much money spent to protect property than life. Unity of purpose in the medical profession will cause the public to do justice toward crippled children.

INTRA-URETHRAL CHANCER: CASE REPORT.*

By CLAUDE G. HOFFMAN, Louisville

If one may judge from the cases recorded in the literature, urethral chancre must be exceedingly rare. The indices at my disposal show only one reference to the subject during the last five years. It would seem, therefore, that the report of isolated cases should be of some interest.

Mr. M. B., aged thirty-three years, first consulted me on December 10th, 1920, presenting two small ulcerated areas just behind the corona glandis. According to the history which he related the incubation period had been only three days, as he stated prior to that time he had not indulged in sexual intercourse for three months, and then had used a condom.

This patient gave an absolutely negative antecedent venereal history. No spirocheta pallida could be demonstrated in the excretion from the ulcerated areas by careful examination made on two consecutive days. Wet saline dressings were prescribed, and on December 16th, the ulcerative lesions had entirely healed.

December 20th, the patient returned presenting a slight balanitis with edema of the

*Read before the Jefferson County Medical Society.

prepuce which could still be retracted. There was no reappearance of the ulceration, and I was naturally in a quandary as to what might be the cause of his present condition. He was given the ordinary treatment with hot compresses etc.

He came to see me again on December 23rd, at which time the prepuce could not be retracted on account of the increased swelling and edema; there was noted a slight discharge from the urethra which showed the presence of staphylococci and a few epithelial cells on microscopical examination. The most natural assumption was that the urethral discharge owed its origin to infection from the pus of the previous ulcers.

The following day the patient left the city for the Christmas holidays, and I did not see him again until January 2nd, 1921. At that time the edema of the prepuce had decidedly increased, the prepuce could not be retracted and the tissues were slightly indurated. There was a foul-smelling discharge from around the prepuce, and efforts at retraction caused the patient considerable pain. There was also bilateral inguinal adenitis.

The condition present was at this time thought probably due to neglect of treatment, as the patient could not treat himself while absent, yet as the lesion looked suspicious of syphilis, I suggested that a blood Wassermann be made. This was done on January 3rd, and a flat negative report returned with two antigens.

As the condition became progressively worse, and the induration of the tissues increased, I suggested the advisability of provocative treatment, and on January 9th, .45 gram of neoarsphenamin was given intravenously, blood being taken at twenty-four and forty-eight hour intervals for Wassermann test. Both specimens were reported flat negative.

Irrespective of local applications the condition steadily became worse, and the patient began to complain of frequent urination without any pain, but he said he had to rise eight to ten times each night to empty his bladder. There was no discharge from the urethra at this time. His first urine was not turbid, but contained a few epithelial shreds. The second urine was absolutely clear.

On January 22nd, another Wassermann examination was made and the first reading was one-plus. I did not attach much importance to this fact, as the patient stated he had for four years suffered with transitory glycosuria, the urine showing the presence of sugar at three day intervals. I discussed this case with a prominent pathologist who suggested that any fault in metabolism might

produce a positive Wasserman reaction, and for that reason I thought this might be the cause of the one-plus. At this juncture I suggested that all treatment be discontinued for two weeks.

I saw the patient again on February 1st. At that time the urinary meatus was nearly closed by an infiltrative swelling, but the edema of the prepuce had subsided to such an extent that the prepuce could be retracted. There was no ulceration whatever behind the corona. I then dilated the meatus and discovered an ulcer on the right lateral wall of the fossa navicularis which I believed was a chancre. Blood was immediately taken for another Wassermann which on examination showed a four-plus positive Wassermann with three antigens on the first and final readings.

On February 11th, intensive, concentrated antisyphilitic treatment was instituted. The edema promptly disappeared and the urethral ulcer rapidly improved. After the first injection of arsphenamin the patient had a slight Herxheimer reaction, this being the first evidence of an eruption noted. Following this he had a typical macular eruption which continued until after the third injection of neo-arsphenamin was given.

DISCUSSION

Wm. J. Young: Intra-urethral chancres, like extra-genital chancres, are usually not diagnosed because the lesions are not suspected. The importance of early diagnosis is well understood by all of us, and the so-called abortive treatment is usually productive of continued negative Wassermann tests where the condition has not become generalized. I have had very good results with the abortive treatment by six arsphenamin intravenous injections in seven days and with (surprisingly) no untoward symptoms. The point of importance to bear in mind is, early search for the spirochaetae wherever syphilis is suspected, or when one is dealing with a supposed initial lesion.

In Dr. Hoffman's case, the spirochaetae were demonstrated only after a number of Wasserman tests had been made and this was of no importance as a diagnostic aid. The demonstration of the germ of syphilis in a luetic lesion is a more constant proof of syphilis, and I would like to ask Dr. Hoffman why he placed his dependence in the Wassermann test in the initial stage rather than using the dark field.

E. R. Palmer: The case reported by Dr. Hoffman is exceedingly interesting. Intra-urethral chancres must be quite rare. In my experience of twenty-five years I can only recall one such case. The patient was a man whom I had treated for chronic urethritis. Some weeks afterward he reported to me with increased frequency

of urination, as stated by Dr. Hoffman, but there was practically no urethral discharge. The patient's only complaint was burning on micturition and frequency. Intra-urethral chancre is characterized by the lack of pain, there is very little inflammatory reaction, and the diagnosis is oftentimes difficult. This patient was observed in pre-Wassermann and pre-spirochaete days (about twenty years ago) and the diagnosis was not perfected until the secondary eruption appeared.

In regard to the extensive induration described by Dr. Hoffman: I hardly think that was due to the initial lesion of syphilis. I am more inclined to think as Dr. Hoffman has stated, that it was due to the balanitis which was present. Chancre of the urethra, or even about the meatus where it is quite common, does not cause a great degree of induration of the surrounding area. I have several patients under treatment for gonorrhea in whom there is considerably more induration about the meatus than is seen in chancre. Specific lesions on the glans penis, on the mucous membrane of the urethra, or even the mucous membrane of the throat and pharynx, do not cause any great amount of induration, and I believe the phimosis and marked induration described by Dr. Hoffman was more than likely due to the balanitis.

C. G. Hoffman (closing): Before reading my report you will recall my statement that the case history was presented principally to show how easily chancre of the urethra might be overlooked. The edema of the prepuce began the third day after exposure and naturally I did not attach any significance to it. I believe, as Dr. Palmer has stated, that the edema and induration were due to the ulcerated lesions behind the corona. Six days later the prepuce could be retracted, the edema having almost entirely disappeared.

When the patient returned about a week later the edema and induration had decidedly increased. There had been no symptoms referable to the urethra and naturally I did not search for a urethral lesion. There was a foul-smelling discharge from around the prepuce and the patient developed a slight urethral discharge which subsided within a few days under argyrol.

When I saw the patient again January 2nd, and found the edema so extensive that the meatus urinarius was almost closed, further search was made for the cause. However, like Dr. Palmer, I do not believe the chancre had anything to do with the development of the edema and induration; I believe these symptoms were purely coincidental, and for that reason the chancre was overlooked for the time being.

If the patient had come to me with the history of exposure three or four weeks previously,

careful search would have been made for the chancre; but as the symptoms developed three days after exposure and the ulcers healed promptly under simple treatment, the most natural assumption was that they were not specific. No spirochaetae could be demonstrated in material obtained from the original ulcers behind the corona.

BRONCHIAL ASTHMA WITH CASE REPORT.*

By J. W. BRUCE, Louisville.

Bronchial asthma has, until the last few years, occupied one of the dark corners of medicine. The pitiful sufferers from this dread disease have spent fortunes in vain attempts to get relief from their distress, going from one physician to another, taking long sea voyages and spending long periods of time at health resorts, and finally, in many cases, falling into the hands of quacks and charlatans. The attitude of the profession toward these patients has been a hopeless one because the etiology of the disease was unknown and treatment was purely symptomatic and almost universally unsuccessful.

However, the brilliant researches of Walker, Schloss, and others have now thrown light on this dark subject. They have proven beyond doubt, that bronchial asthma is a manifestation of anaphylaxis or sensitization to protein, that an accurate diagnosis of the offending protein can be made, and that in most cases, treatment can be successfully carried out by immunizing the patient with graduated doses of protein or by protein plus vaccines.

There are four general classes of proteins that can cause bronchial asthma: Foods; Animal Emanations; Pollens; Bacteria.

Any food may cause the disease, but the commonest ones are the cereal grains, eggs, milk and fish.

The dandruff or hair from any animal may cause asthma. The commonest ones, of course, are the domestic animals, horse, dog and cat. The feathers of fowls come under this heading, those of chickens and geese being the most common.

Pollens from plants can cause bronchial asthma, as well as hay fever. In fact, these two diseases are practically identical processes in different anatomical locations; asthma, affecting the bronchioles, and hay fever, the mucous membrane of the nose and conjunctivae.

Bacteria can cause asthma not from the toxins eliminated, but from the sensitization

*Read before the Jefferson County Medical Society.

to the protein of the bacterial cells. This explains the cases which are associated with focal infections and are cured when these infections are eliminated.

The technique of making these tests are simple. The forearm is cleansed with alcohol, and a series of scratches is made with a needle or scalpel. A few grains of the protein to be tested and a platinum loop on one-tenth normal sodium hydroxide is then put on each scratch and rubbed in with a flat toothpick. Observations are made every ten minutes for thirty minutes. A positive reaction is shown by the formation of an urticarial wheal surrounded by an area of erythema in strongly positive cases, and by the erythema alone in cases less positive. A control scratch should always be made.

Treatment of bronchial asthma may be carried out successfully by avoiding the offending protein entirely, if this is possible, or by taking minute and gradually increasing doses of the protein, so as to develop immunity to it. This can be taken either hypodermically or by mouth in the case of food proteins and by hypodermic in the case of pollen, bacteria, or animal emanation. In case bronchitis and secondary infection are superimposed on the asthma, autogenous vaccines are useful in conjunction with the protein.

There are two points to which I would like to call attention before going into the case history:

Multiple sensitization, that is, sensitization to more than one protein, is much more frequent in cases of asthma, which begin during infancy than in those which develop in later life.

Symptoms of asthma may appear only when large amounts of the offending protein are given and may disappear entirely when smaller amounts are given. This is particularly true of the food proteins.

CASE HISTORY.

The patient, M. B., is a three months' old white female baby. The family history is entirely negative.

Previous History: The baby weighed five pounds, thirteen ounces at birth, and was several weeks premature. She was breast fed for ten days. She then had a stormy fermentative carbohydrate indigestion for about two months, but by the time she was three months old, she weighed 8 pounds, fifteen ounces, and was in fairly good physical condition. Her food consisted of "Dryco" milk powder, and she was taking three and one-half ounces seven times in twenty-four hours. The stools were normal and she was gaining weight consistently.

Present Illness: Christmas Eve, 1920, she began to cough, and her breathing became labored and wheezy. This cough became progressively worse and on Christmas day I saw her.

Physical Examination: The thing that arrested attention on inspection of the baby was the dyspnea and the wheezy respiration. This was so noisy that it could be heard across the room and had all the characteristics of asthmatic breathing; that is, the expiration was prolonged and difficult and the chest seemed larger than usual. There was a slight nasal discharge and examination of the throat revealed nothing abnormal. Percussion of the chest revealed a hyper-resonant note throughout. Auscultation revealed many large and small, squeaky, moist rales all over both lungs. Expiration was greatly prolonged but the breathing was vesicular in quality.

The heart, abdomen, genitals, extremities, and skin were normal. The temperature was normal and the respirations between 60-70. The cough was persistent and distressing. An attack of coughing was induced whenever the baby attempted to nurse its bottle, so that before it had taken more than one or two ounces, it would cease entirely. There was more or less cyanosis with these attacks although between them there was none. Sometimes it would cough so severely that it would vomit its food. The baby was not prostrated and its senses were not in the least dull.

Diagnosis: The diagnosis lay between; acute spasmodic bronchitis; whooping cough, and bronchial asthma.

Acute bronchitis with spasm of the bronchioles may closely simulate bronchial asthma. In bronchitis, however, the spasm does not appear for several days after the cough has begun, whereas in this case the spasm was present from the beginning. Also, in acute bronchitis there is practically always fever, but in this case, although the temperature was taken by rectum every four hours, there was never a temperature of over 99.2. The absence of prostration and dulling of the senses was another argument against bronchitis.

Whooping cough had to be considered but the absence of a history of exposure and the fact that the baby's little brother and sister, who were constantly in the room, never contracted whooping cough, are good arguments against this disease. The fact that the baby never "whooped" does not rule it out, because sometimes a young infant does not "whoop." The subsequent history of the case excluded whooping cough.

This leaves bronchial asthma. The points

in favor of this diagnosis were: the sudden onset of labored, wheezy respiration with prolonged expiration, the distressing cough, the physical signs in the chest, the absence of fever and prostration.

Treatment: For the first three days antispasmodic remedies of various kinds were used one after another without benefit. Steam inhalations with tincture of benzoïn compound were used with wine of ipecac by mouth. Benzyl benzoate 20% alcoholic solution was then tried, beginning with one drop in each bottle and increasing to four drops in each bottle or twenty-eight drops in twenty-four hours, but it had no effect. Sodium bromide gr. $\frac{1}{2}$ with tincture of belladonna one minim, had a slight quieting effect, but did not relax the spasm of the bronchioles. A hypodermic or two minims of adrenalin (1-3200) had a slight temporary effect, but four minims of the same preparation later on had no appreciable effect. An inhalation of smoke from burning stramonium leaves made the asthma worse.

Since the baby was unable to take more than two ounces at a time from its bottle, its weight began to fall and it was decided to feed by stomach tube. This proved to be a life-saving measure, for whereas the bottle feedings had been prolonged, ineffectual, and exhausting to both baby and its mother, the tube feedings were quick (the process taking not more than three minutes) and effectual, (because the feedings rarely started a coughing spell and sometimes the baby did not even awaken,) and the baby began to gain faster than it ever had before, gaining six ounces in four days.

On the fourth day of the disease, cutaneous protein sensitization tests were made by Dr. John W. Moore. The following proteins were tested: lactalbumin, casein, whole cow's milk, chicken feathers, goose feathers, sheeps wool, staphylococcus albus and aureus, and streptococcus hemolyticus, nonhemolyticus, and viridans. Reactions were positive to lactalbumin, whole cow's milk and chicken feathers. All the others were negative. This bears out Walker's statement that multiple sensitization is common in infants.

The reason the baby was tested against chicken feathers was that it was sleeping on a chicken feather pillow. This pillow was immediately removed and the result was remarkable. Within an hour the dyspnea and wheezing were markedly diminished. The next day the baby was much better. The wheezy respiration was barely noticeable and the attacks of coughing were much less frequent. Within a week the rales had disappeared from the chest, but we were unable

to discontinue tube feeding for two weeks, because every time bottle feeding was attempted a violent coughing spell was started.

A remarkable incident took place seven days after the chicken feathers had been removed from the baby's bed. By this time the wheezing had almost disappeared, and, in fact, was not noticeable a large part of the time. On this evening the baby's mother having put on her hat to go out, came in to see the baby. The infant was lying perfectly quiet and comfortable in its nurse's lap. The mother leaned over to look at the child, and in doing so her hat came within a few inches of its face. Almost immediately the baby began to wheeze and choke, just as it had done when it first became sick. The mother, being thoroughly aroused to the danger that chicken feathers have for her baby, took off her hat to see the kind of feathers with which it was decorated. They were chicken feathers.

This sounds like a fairy tale, but the same identical incident was repeated the next night. The nurse was putting the baby to sleep and it was so unusually quiet that she called the mother in to look at it. The latter was just on the point of going out and had on the same hat. She leaned over it in the same way and immediately the baby began to wheeze.

Although this baby was almost relieved of its asthma by the removal of chicken feathers from its environment, still it remained very susceptible to changes in weather and with such changes it developed cough and occasionally a little wheezing. It never at any time had any fever. All this time the baby was being fed on "Dryeo" Milk which contains 4% protein and therefore a larger percentage of lactalbumin even than whole milk. Believing that this feeding was responsible for the continuance of the asthmatic symptoms, the food was changed to a half-and-half-milk-and-water mixture, with 6% dextrimaltose. This contained 1.8% protein. The asthmatic symptoms disappeared completely as soon as this was done. This bears out the observation of Schloss and others that sometimes a small amount of the offending protein can be eaten, but when larger amounts are taken the symptoms of asthma appear.

The diagnosis of bronchial asthma is justified in this case for the following reasons:

The sudden onset and typical physical findings of asthma.

The positive skin reactions to lactalbumin and chicken feathers.

The marked improvement after the removal of chicken feathers and the complete recovery after reduction of the amount of lactalbumin.

DISCUSSION:

C. W. Karraker: The paper read by Dr. Bruce is certainly very interesting and I have enjoyed it greatly. I have been unfortunate enough to have seen five or six cases such as he described. One of them, a little boy, cannot even put his finger in the icing of a pie without producing an attack of asthma and a general swelling of his body which resembles a case of extensive poisoning. Another child cannot take cream without producing a similar state of affairs.

I have been able to make careful tests in three of the cases, and the asthmatic attacks in these are due to food proteins. The most important item in treatment is to ascertain and avoid the protein which causes the asthma.

The main point I want to make is that I find most of these cases can be traced to syphilis. I have been able to get a Wassermann test made on three of these patients showing a positive reaction. These, of course, yielded to mercury treatment.

James W. Bruce, (closing): I have little to say in closing. Walker makes a statement quite in line with what has been said in discussing the diagnosis between bronchial asthma and what he terms asthmatic bronchitis, by which he means ordinary bronchitis with an asthmatic or spasmodic element very marked in type in connection with it.

Walker claims that the cases of asthma in infancy (below two years) about four-fifths are due to protein sensitization. During childhood (ten to twelve years) two-thirds are sensitive to some form of protein. The percentage gradually decreases and after the age of fifty years practically none of the cases are due to protein, practically all of them being due to acute bacterial infections.

Priapism Caused by Scrotal Myxosarcoma.—Cowie reports a case of a rapidly developing tumor in the scrotum associated with what he believes to be multiple metastatic growths in the skeletal structures, intracranial changes, indefinite intrathoracic changes particularly on the left side, not involving the heart; with a history of injury which, however, occurred, apparently, after he first complained of back stiffness, but which may have had an influence in the process. It was impossible to determine the cause of the painful rigidity of the back and neck muscles. The patient seemed to be holding himself for fear of being hurt. The boardlike stiffness resembled that described by Escherich in his cases of pseudotetanus. Instead of more than one process being at work to induce the different groups of symptoms, Cowie believes the entire process to have been due to a malignant tumor with bone and visceral metastases.

THE ORTHOPEDIC TREATMENT OF INFANTILE PARALYSIS.*

By B. SEGUI O'BRIEN, Louisville.

It is not my purpose in this paper to discuss the treatment of infantile paralysis from any standpoint other than as an orthopedic problem. That this side of the treatment is neglected in a great many cases is evidenced by the large number of cases with contractures and deformities seen in the orthopedic clinics of any of our large cities.

For the sake of convenience, the disease may be divided into three stages.

The first, or acute stage, which starts at the onset of the disease, and continues until the disappearance of sensitiveness. This stage usually lasts from one week to three months.

The second, or convalescent stage, beginning at the end of the acute stage and continuing until spontaneous recovery or improvement ceases. This stage usually lasts about two years.

The third, chronic or stationary stage, beginning when improvement ceases and deformities and contractures, if present, have become established.

As the orthopedic treatment of infantile paralysis has so much to do with the prevention and correction of deformities, let us consider the causative factors of these deformities and the general plan of their prevention before proceeding with the treatment of the different stages.

Vulpinus says: "The normal position of a joint in the living body is determined and maintained by the equilibrium existing between the various muscles surrounding the joint brought about by the elastic tension of the muscles and tendons also by muscle tone.

When a muscle, or group of muscles, is paralyzed, the joint in proximity loses its normal muscular balance. As a result of this loss of balance, the force of gravity, or the unopposed action of the normal muscles acting against the paralyzed muscles, or both combined, holds the joint in a faulty position. If this malposition of the joint is not corrected, and held corrected, gradually the soft tissues on one side will contract and those on the opposite side become stretched, as it is the physiological property of tissue always to "take up slack." Paralysis of all the muscles around a joint is followed by a relaxation of the joint capsule, and a flail-like condition of the joint is the result.

In the early stages these contractures are easily overcome by manually stretching the contracted tissues. If allowed to persist, teno-

*Read before the Jefferson County Medical Society.

tomies and fasciotomies may have to be done before they can be corrected. If the patient uses the limb with the joint or joints in a faulty position, the bones too, will in time change their shape and structure in accordance with Wolff's law, which is, "Every change in the form and function of the bones or of their function alone is followed by certain definite changes in their internal architecture, and equally definite secondary alterations of their external conformation, in accordance with mathematical laws."

As these deformities are due primarily to contractures, their prevention is accomplished by holding the joint in such an attitude that they cannot occur. If all the muscles around a joint are paralyzed, the joint should be held in a neutral attitude, but if a muscle or group of muscles on one side of a joint only is paralyzed, the joint should be held in an over-corrected attitude, as a muscle that is paralyzed has a much better chance to recover its power when relaxed. This is due to the fact that muscles have their nerve supply from more than one segment of the spinal cord, and as the cord is rarely uniformly involved in the inflammatory process, some segments may escape damage. A muscle, or group of muscles, so affected is only partially paralyzed and, as has been seen, has a diminished nerve supply. If the muscle is stretched the nerve supply may be insufficient to stimulate contractions, and so become still weaker or completely paralyzed; but if the muscle is held in a relaxed position, the nerve supply may be sufficient to stimulate contractions and so maintain the tone of the muscle and help it to spontaneous recovery.

The paralyzed muscles can be kept relaxed in various ways. The most common methods are the use of braces of steel or iron, splints of wire or celluloid, and starch or plaster of Paris bandages. In the majority of cases, as long as the patient is confined to bed, and in many cases afterward, I prefer the plaster of Paris bandage, as it is comparatively cheap, easy to apply, requires no aid from a brace-maker, and is comfortable and efficacious. It has the added advantage, too, that it keeps the muscle continuously relaxed until it is removed by the surgeon, which is not always the case where braces or splints are used.

Let us now discuss the prevention of a few of the most common deformities in the various parts of the body.

In the trunk, paralysis of the back muscles predisposes to a deviation of the spine to one side or the other with a resulting scoliosis. This is due to unopposed muscle pull and habitual posture in the early stage while the

child is still in bed, and the added one of gravity and superincumbent weight after the child assumes the erect posture. If once established, a paralytic scoliosis has a tendency to progress quite rapidly. It is therefore of the utmost importance to prevent its occurrence, as I know of no deformity due to infantile paralysis that is so intractable to treatment. At the very first sign of a deviation of the spine, a child under three years of age should be placed in full extension, or even hyperextension, of the spine upon a rectangular stretcher frame made of gas pipe covered with canvas. The child is held down to this by an apron fastened to the side bars of the frame. In a child over three it is better to apply a light plaster of Paris jacket, or use a Knight or Taylor spinal brace. These appliances must be kept on for an indefinite length of time. When finally it is considered safe to leave them off, the back must be watched very closely, and at the first sign of asymmetry or increase in the scoliosis, if it already exists, they must at once be reapplied.

Paralysis of the abdominal muscles predisposes to a lordosis of the spine. In paralysis of these muscles, as a rule, it is not necessary to use any apparatus until the patient assumes an upright position, when an abdominal supporter, corset of celluloid, or plaster of Paris jacket must be worn.

In the upper extremities the muscles most frequently paralyzed are the deltoid and the external rotators of the arm, either alone or in combination. When the deltoid is paralyzed the humerus tends to drop away from the glenoid cavity and consequently stretch and elongate the capsular ligament, the arm hanging limp at the side, either in a neutral position or in internal rotation, depending upon whether the external rotators are also involved. In this condition the arm should be kept elevated to at least a right angle to the trunk. While the child is still in bed this is easily accomplished by tying the arm to the head of the bed with a flannel bandage. When the patient is up, we must use a right angle splint or brace, with a chest and arm piece to maintain the arm in the desired position. If the external rotators are also involved, an upright at the elbow joint must be added and the forearm strapped to this. In this position both the deltoid and the external rotators will be relaxed. If objection is made to the use of this apparatus on account of its awkwardness and unsightly character, the arm must be supported by a sling. The other muscles of the upper extremity are less frequently involved. When they are, however, apparatus of various kinds must be employed to keep the affected muscles in a state of relaxation.

In the lower extremity, the most common deformity at the hip is a flexion. In the mild cases, while the patient is still in bed, this may be overcome by the simple expedient of placing a pillow under the hips. If this is not sufficient the patient must be placed in a plaster of Paris spica with the hip in full extension. After the patient is up and around, a double upright brace with a pelvic band with the hip in full extension will answer the purpose.

About the knee the quadriceps extensor is the muscle most frequently paralyzed, but it is not at all uncommon to have one or more of the hamstrings involved, either alone or in combination with the quadriceps. It is rarely necessary to use any apparatus in the acute stage, as contractures here take place slowly. During the convalescent stage when the patient is allowed to bear weight on the limb, a brace or support of some kind may be needed, depending upon whether there is a tendency to recurvature or flexion of the knee.

Below the knee it is not uncommon to have a complete or almost complete paralysis, producing the so-called "dangle foot." In these cases the foot must be held at a right angle to the leg and in a neutral position in regard to adduction or abduction. This can be done with plaster of Paris or a light ankle brace with a stop joint to prevent plantar flexion. Paralysis of the dorsiflexors of the foot is treated in the same manner. If the tibiales are paralyzed with the foot in abduction, a plaster of Paris bandage must be applied to hold the foot in marked adduction. A light double upright ankle brace with a "Y" shaped piece of leather fastened to the inner side of the shoe under the arch with the arms of the "Y" going in front and back of the ankle and buckled around the outer upright of the brace will also serve the purpose. With this brace the sole and heel of the shoe should be raised on the inner border. When the peronei are paralyzed the same brace with the "Y" on the outside, and the shoe raised on the outer border, will hold the foot in the desired position of abduction. If the calf muscles are paralyzed plaster of Paris or a double upright brace with a stop joint at ankle, preventing dorsi-flexion beyond a right angle will do.

The above is only an outline of the various methods used to prevent deformity, as each case must be studied and the apparatus chosen that will best fit the requirements of the individual case.

Let us now consider the orthopedic treatment of the different stages. In the first or acute stage rest is of paramount importance,

as we are dealing with an inflammatory process of the spinal cord. This is best accomplished by keeping the patient in bed with boards between the springs and mattress, so that the patient lies on a flat, unyielding surface. This tends to prevent awkward positions being assumed, which predispose to the formation of deformities. Hohmann advises the use of a plaster of Paris jacket, so as to insure rest to the spinal column. I do not believe this is necessary excepting in those cases that show a developing scoliosis.

Electricity has been extensively employed in this stage, but it is without value, and only tends to annoy the child. Lovett says in his book on the Treatment of Infantile Paralysis: "There is absolutely no evidence to show that the use of electricity at this stage is of any benefit or has any local effect either upon the organism or the affected cord."

Massage should not be used in this stage either, as it tends to increase the already existing tenderness. Lovett says that he used massage in the case of a boy at the end of the tenth week when only slight tenderness was present, and that in one week the patient became so tender that he could not bear the weight of the bed clothes and had to be placed in plaster of Paris until the tenderness disappeared.

During this stage the patient must be closely watched for beginning contractures and at the first sign of their appearance plaster of Paris, or some other of the previously mentioned methods, must be employed to prevent them. This is very important as a deformity is an obstacle to any form of treatment.

The second or convalescent stage, as has been said, begins at the cessation of tenderness and continues until improvement ceases. More can be done to aid the restoration of function to the weakened and partially paralyzed muscles during this period than at any other. The weakened muscles must be strengthened by exercise and massage, and the impulses from the brain to the muscles must be taught to travel new routes. This is possible for there are innumerable paths of connection of the different segments of the cord with one another and with the brain. As has been said, it frequently happens that all the nerve centers controlling a muscle or group of muscles are not permanently destroyed, therefore some paths may still be open. At the beginning of this period the muscles should all be tested so as to ascertain the extent of the damage done, which muscles are apparently totally paralyzed, which only partially paralyzed, and the ones that are unaffected. The result of this examination should be recorded on a chart kept for the purpose

with an estimate of the power still remaining in the muscle, as normal, good, fair, poor, very poor, and none. If desired, a more accurate test may be made with spring balances, according to the method devised by Dr. E. G. Martin, of Harvard University, and the result recorded in pounds and ounces. By keeping such a chart and testing the muscles at intervals, it is possible to note the improvement or absence of improvement in the various muscles during the entire course of treatment in this stage of the disease.

As the acute stage has now ended, the patient is allowed to sit up, and in a short while try to walk with the aid of whatever apparatus is necessary to support the weakened muscles and also to prevent their being stretched.

The therapeutic measures employed at this stage to aid in the restoration of nerve and muscle power are electricity, heat, massage and muscle training.

Electricity: The Faradic current produces mild local contraction of the muscles and is therefore useful as a gentle, passive exercise. Too much must not be expected from its use and if it terrifies the child, as it sometimes does, it had better be dispensed with altogether, for we must have the confidence of the child in order to properly carry out the more beneficial measures.

It is doubtful if the galvanic, high frequency, sinusoidal or Morton wave currents are of any benefit, although each has its champion. They do no harm, however, so may be tried, if desired, unless they, too, frighten the child.

Heat: Heat favors the contraction of muscles and stimulates circulation, and is therefore advantageous.

Massage: Massage is beneficial as it produces a mechanical stimulation of the muscles and so helps to maintain their tone. It also aids the general condition of the limb, as it improves the circulation of the blood and lymph. Stroking and kneading motions are all that are necessary. Massage should not be painful, so we must be guided by the patient's feelings as to how much force to employ. In most cases two daily sittings of ten or fifteen minutes' duration are sufficient. Vibration has practically the same effect as massage, so it, too, may be used.

Muscle Training: This is the best means that we have to aid the paralyzed muscles to improve. This is a matter of so much importance that I will describe briefly how it should be done.

Exclude everyone from the room with the patient but the one who is to direct the exercises in order that the patient's mind may

be undiverted from the exercises to be performed. Free the limb to be tested and exercised of all clothing and place the patient on a table or some other hard, smooth, horizontal surface, thereby reducing the resistance of friction to a minimum. The joint controlled by the muscle to be tested and exercised is placed in a suitable position, so that gravity and friction will be overcome as much as possible, and the patient directed to perform a certain movement calling into play the action of this muscle. During the attempt to perform this movement the muscle or its tendon should be closely watched, or palpated, for any sign of contraction. There may be normal response, there may be fair response, there may be slight response, or there may be no response. The result should be recorded on the chart, as previously stated.

In case there is no response, instruct the patient to concentrate his attention on the attempt to perform the desired movement, and the movement is then carried out passively by the attendant several times. When there is some power remaining in the muscle, it may be possible to perform part of the desired movement voluntarily. In such a case, the remaining part of the movement should be done with the assistance of the surgeon, the aid coming in time to make the movement smooth and even throughout the entire arc.

When the muscles are capable of performing the desired movement through the entire arc without assistance, resistance to this movement should gradually be used by the surgeon. The resistance should be weak at the beginning of the movement, gradually getting stronger at the middle, and weak again at the end. Never use resistance until such time as the muscle can perform the entire movement voluntarily, as no strain should be put upon the weakened muscles. This may take a few weeks for some muscles and many months for others and in still others power never returns.

Each exercise should be performed slowly twelve to fifteen times once a day, six days a week. The one day rest tends to keep the patient from getting stale. In this way muscles are strengthened and aided to regain their power and to use what power still remains.

It is well known that during the convalescent stage of infantile paralysis many muscles improve, and some regain full power without any treatment, as few cases are as hopeless as at first appears. The value of muscle training and carefully regulated exercise has been proved clinically in a great many cases. Cases in which improvement had come to a standstill have been still further improved after a course of muscle training.

The third, chronic, or stationary stage: This is the stage where improvement of the muscle power has ceased and any contractions and deformities that have been allowed to occur are fixed. The treatment of this stage is therefore largely surgical.

It is to be expected in infantile paralysis that many cases reach this stage with complete loss of power in some muscles, and partial loss of power in others, but very few if any should reach this stage with fixed contractures and deformities, as their presence is evidence of inefficient and unsuccessful treatment during the early stages.

It is beyond the scope of this paper to describe in detail the various operations devised to help the unfortunate victim of infantile paralysis. Suffice it to say that operations are performed to correct a deformity, improve the attitude of a limb, stabilize a joint, or to transfer muscle power to a part where power has been lost. These operations consist of tenotomies, manual stretchings, fasciotomies, myotomies, arthrodeses, astragalectomy, tendon transplantation, tendon implantation, and various other like procedures that will enable the patient to use his limbs and the muscle power remaining to the best advantage.

In summarizing, I want to emphasize the fact that the large majority if not all of the deformities due to infantile paralysis are preventable. We should therefore anticipate them by careful observation and the institution of suitable treatment early and its maintenance as long as necessary. The various therapeutic measures employed, such as electricity, massage, and muscle training should be used only by those who are competent and under the supervision of the physician. Braces, corsets, and the various other apparatus used should be prescribed by the physician and not left to the bracermaker. Frequent examinations of the patient should be made so that apparatus may be altered when necessary, or discarded entirely at the proper time. Major surgical operations should not be done until improvement has come to a standstill. Only in this way is the physician able to give to the patient his best efforts and benefit him as much as is within his power.

DISCUSSION

W. Barnett Owen: Dr. O'Brien's paper is very exhaustive and most thorough. The subject of infantile paralysis is of great importance to all of us, and especially to those of us who are doing orthopedic work. It seems that we have an epidemic of infantile paralysis about every ten years, at least history has proven this for the last thirty years. The last one (1916) was the most severe we ever had, there being some-

thing over twelve thousand cases in the United States. It is said that eight thousand of these cases occurred in the State of New York. Of that number approximately twenty-five per cent died, about twenty-five per cent recovered completely, and the remaining fifty per cent were paralyzed to a greater or less degree.

Unfortunately we only see infantile paralysis as a rule in the third stage. The first and second stages, and especially the first stage, may be passed without attention being directed to the character of the disease. This is an affection in which the diagnosis is sometimes very difficult, because its onset is similar to that of other acute infections. The first sign noted, unless it is purely of the epidemic type, is some form of paralysis, usually involving the muscles of the lower extremities. In the majority of instances where there is group muscle paralysis it is due to so-called infantile paralysis of anterior poliomyelitis.

We have learned, mainly from men in the east who have dealt with infantile paralysis in such an extensive way, that absolute rest is the most important feature in the treatment. Much more harm is done by over-exercise than by too much rest. The remainder of the treatment, as stated by the essayist, consists in protection of the patient and the prevention of deformity, conservation of function, and the employment of such methods operative and otherwise as will cause a return of function.

If we have group paralysis in a certain part of the body, we necessarily know the type of deformity we are certain to have, and we then know what sort of apparatus will be necessary to prevent that type of deformity. We also know that the definite degree of paralysis cannot be finally determined under two years. For that reason no operative procedure is indicated during that time unless mechanical means fail to prevent deformity.

Scientific muscle training is most helpful, preceded by the application of heat and massage.

Robert T. Pirtle: As stated by Dr. O'Brien and Dr. Owen, we do not see cases of infantile paralysis as a rule in the early stages. About the only places where they come to our notice are in the large orthopedic hospitals. I remember when in the Hospital for the Ruptured and Crippled, New York, two or three patients with acute infantile paralysis were admitted. In these cases the paralysis involved both lower extremities, the patients being in a helpless state, they could not even move their toes.

The orthopedic treatment of infantile paralysis is a very broad subject, and it would be impossible to discuss in detail even the most important features. In many cases a combination of surgery and mechanical measures should be employed to secure the best results. Especially is this

true in the case of "dangle legs," where a child four or five years of age is unable to stand. In such cases the ankles may be fixed by doing an arthrodesis or astragalectomy, making a solid ankle on which they can stand, then with a double upright brace extending from ankle to knee attached to pelvic bands to allow motion at the hip, the patient can sit down and by the use of crutches can navigate comfortably. Without this type of apparatus the patient is unable to use crutches. They have what is described by Brackett as a "tripod way" of walking, but it helps them in going from place to place. I have seen them after they became older when there was greater development of the upper arm and back muscles, and by the use of crutches they could swing the legs along very well.

There is a type of operation which Gallie, of Toronto, has used to some extent in cases where the peronei muscles are paralyzed and the foot is held in marked equinus position: He transplants the peronei tendon in a groove which he makes in the lower end of the fibula. He draws the tendon through this groove and sutures it in place thus making it act as a suspensory ligament. He does not hope by this operation to restore power to the paralyzed muscles but he corrects the faulty position of the foot by transplanting the tendon and thus enables the patient to walk. There is some prominence of the lower end of the fibula at the site of the operation but this gradually becomes smaller when the callus is absorbed.

I do not believe in delaying operation in cases of infantile paralysis as long as many surgeons recommend. Some of them advise waiting until the child is twelve or fourteen years of age. I do not see any advantage of waiting this length of time before performing arthrodesis, tendon transplantation, or any other operation that may be indicated. I believe operation should be performed early and thus enable the patient to walk. It is important to remember that the bones may become atrophic from non-use and especially liable to fracture from slight trauma. I recall a case of infantile paralysis which came to the Louisville City Hospital two years ago, a girl about fifteen years of age, who had so-called dangle leg, and Dr. O. R. Miller operated to straighten the knee. A double upright brace was then applied and the girl was able to navigate with some degree of comfort by the aid of a crutch. This girl slipped on the street and sustained a complete fracture of the femur. She was brought to the hospital for treatment, but union was delayed for many weeks and even now I believe the leg is practically useless and Dr. Miller is considering the advisability of amputation. The bones become very brittle in some of these cases and fractures occur after the slightest trauma. I saw a case in the Hospital for the

Ruptured and Crippled where the patient's leg simply fell over the side of the bed and the bone "snapped off like a clay pipe stem."

Orville R. Miller: One point in Dr. O'Brien's paper about which I wish to speak particularly is the necessity of muscle training. I believe regardless of the operative procedure which may be instituted that it is necessary afterward to go through the process of muscle training. I suppose all of us have seen patients with seemingly complete paralysis following the disease under discussion, where after the proper type of operation had been performed and the patient began to bear weight on the affected leg, while at first he could not use the part freely, yet motion finally returned and greater function than we anticipated was secured.

I remember hearing Dr. P. F. Barbour state that he believed there were new association fibres formed in these cases. Might it not be possible that this is the proper explanation of restoration of function in some of the muscles which were apparently completely paralyzed? Whether or not these muscles were really completely paralyzed, or whether new association fibres were formed, I do not know; but as Dr. Pirtle mentioned, weight bearing is important. The patient should be induced to use the part and bear weight on it to prevent changes in the bone. According to Wolff's law it is well known that the bones become stronger by use. By encouraging the patient to use the limb, the formation of new association fibres may also be possible.

It takes a great deal of perseverance and patience on the part of the surgeon to keep the patient interested in the muscle training process. The patient becomes discouraged and so does the doctor, but I believe if the plan is continued the result will be gratifying in many cases.

John. D. Trawick: The suggestion Dr. Miller makes of the possibility of new association fibres being formed, i. e., that power may still exist in the affected muscle, is an important point. The possibility of recovery of the affected muscle has bearing on the surgery of paralyzed tendons.

Tendon transplantation should not be attempted until it has been proven beyond a doubt that the affected muscle has no possibility of future restoration of function, through motor impulses that might ultimately find their way through by way of these so-called "association" routes. Otherwise one is liable to find that the restorative effort has been overdone with a resulting over-balance of muscle pull on what was once the paralyzed side.

B. S. O'Brien (closing): With reference to Dr. Pirtle's remark about early operations in cases of infantile paralysis: It has been shown that power not infrequently returns after prolonged relaxation where muscles are thought to

be completely paralyzed. Jones cites a case in which he performed arthrodesis at the knee where paralysis had occurred quite a number of years previously. He removed the plaster dressing and was surprised to find that while the arthrodesis had failed, the power had returned to the apparently paralyzed quadriceps muscle. That was quite a number of years after the attack of infantile paralysis.

I wish to thank the members for the discussion of my paper.

CONGENITAL HYPERTROPHIC PYLORIC STENOSIS. CASE REPORT.*

By J. GARLAND SHERRILL, Louisville

The subject of this report is a child now four years of age who first came under my observation in 1916. The child had congenital hypertrophic pyloric stenosis symptoms of which developed when four weeks old and had existed for a month when the patient was referred to me, October 28th, 1916, by Dr. Anna McKamy, of New Albany, Indiana, and Dr. P. F. Babour, of Louisville.

The child had been unable to retain food for about four weeks and had lost steadily in weight after the onset of symptoms. The usual signs were present, i. e., projectile vomiting, constipation and rapid loss of weight. The child was treated for one week with belladonna, but this failed to relax the pylorus. The diagnosis of congenital hypertrophic pyloric stenosis was confirmed by the radiogram.

Operation was performed November 6th, 1916, the steps of the procedure proposed by Rammstedt being followed. This consists of a longitudinal incision through the constricted pylorus dividing the structures downward to the submucosa or line of cleavage between the muscular and mucous coats. A pair of blunt-pointed curved scissors or a hemostat may be used to separate the tissues beyond the line of incision so as to make sure of the patency of the pylorus. Instead of this however, the incision may be lengthened, a procedure now generally adopted.

The mucous membrane protrudes freely into the wound. The hemorrhage is usually very slight and easily controlled by hot sponges. Occasionally a ligature may be needed. After hemorrhage is controlled the tumor is replaced in the abdomen and the wall rapidly sutured.

The line of cleavage is more decided near the gastric end and the forceps or scissors

used to spread the incision should enter there if this step is found necessary.

For a time a modification of the Rammstedt method was employed, which consisted of passing a sound through the constricted pylorus by way of an incision transversely placed in the gastric wall. This step has since been abandoned.

Dr. E. D. Smith, of this city, employed a tube passed through the esophagus and manipulated by the operator through the pylorus. This can readily be accomplished and assures one of the patency.

Both of the latter steps are ingenious but do not materially add to the success of the operation and cause some expenditure of time.

This operation is quite simple and if the patient comes to operation before he is exhausted from lack of nourishment the result should prove quite satisfactory.

In 1916, Dr. William A. Downes, of New York, reported sixty-one cases operated upon by Richter, Scudder and himself by posterior gastroenterostomy with a total mortality of 22% (14%, 24%, and 32% respectively), a much lower rate than previously reported in so large a series.

Beginning with October, 1914, Downes began to employ partial pyloroplasty according to the method of Rammstedt. He has reported thirty-five cases treated on this plan, nineteen with the sound (similar to the method of Keefe) and eighteen without the sound. In this series there were eight deaths or 23% mortality.

Among the advantages of the Rammstedt operation may be stated: About one-half as much time is required and much less manipulation is necessary. Both of these are important factors in determining the outcome of operation in a delicate infant. The canal remains normal and feeding may be commenced within two or three hours after the operation. Two or three drams of breast milk may be given alternating with like quantity of water every two hours, rapidly increasing the amount until one to one and a half ounces every three hours are given.

The theory propounded by Dr. Downes to explain the sequence of events in this disease is that a true malformation is present at birth consisting of an abnormal thickening of the circular muscle of the pylorus, and that the effort necessary to force food through the narrowed and elongated pyloric lumen produces circulatory disturbance resulting in edema. As the food is increased in amount and the muscular effort increased the lumen narrows until at about the tenth day obstruction is complete.

Gastroenterostomy requires a longer time

*Clinical report with exhibition of patient before the Jefferson County Medical Society.

for its accomplishment, more manipulation, more danger of a leak, and will undoubtedly show a higher mortality in the same class of cases.

The symptoms which make this diagnosis possible are: Projectile vomiting, peristaltic waves, gastric retention, rapid loss of weight, and the presence of a palpable tumor or mass in the region of the pylorus. These symptoms may develop some weeks after birth. Marked constipation may be present although a starvation stool or even milk may pass. Constipation is not a necessary symptom.

DISCUSSION

E. Dargan Smith: Dr. Sherrill referred to a case which I operated upon recently. We have nothing especially new to offer, but the reiteration of a few facts not generally appreciated might be of value.

Most of these cases are generally wrongly diagnosed as some functional intestinal disturbance, error of fat digestion, or something of that kind, and the patients are treated medically until they are very much emaciated and bad surgical risks. The general practitioner and the pediatrician especially are on the lookout for cases of this kind, but the general practitioner does not always recognize them as early as he should.

Increased peristalsis is one of the first symptoms. In my case, referred to by Dr. Sherrill, that phenomenon was very marked, it looked like a mass the size of a billiard ball moving across under the abdominal wall, and at times there would be noted an apparent tonic contraction which would be maintained for six to eight seconds. Occasionally one could see as many as three waves.

Dr. James W. Bruce was associated with me in this case and looked after the feeding of the infant. I think it is very important for the surgeon to co-operate with the pediatrician especially in the after-care of these cases, because the feeding must be carefully handled, beginning with a small quantity of suitable food, gradually increasing the amount and strength of the mixture. If this plan is followed the infant's chance for recovery is markedly improved.

In this case the child was seven weeks old when symptoms began, and was eleven weeks old when complete obstruction developed and the operation was performed.

The muscular tissue of the pylorus in these cases is very thick, the mucous membrane being "doubled up" on the inside so there is no opening through the pylorus. Dr. Sherrill spoke of the necessity of avoiding cutting into the mucous membrane in making the dissection. In making the first incision it is best not to go all the way through the muscular coat, but only about

two-thirds the thickness, then take a pair of forceps, blunt scissors or the handle of a scalpel and separate the muscles instead of incising them, going down to the submucosa, then by dissecting a little further on each side the mucous membrane will bulge into the wound.

Dr. Sherrill spoke of my introducing a tube through the pylorus: We had been washing out the stomach of the child with various solutions, and it struck me since Downs had used a tube by making an opening through the stomach wall, it would not be impossible to pass a catheter by way of the mouth through the stomach into the duodenum to determine patency of the pyloric opening. At the time of the operation a catheter was passed into the stomach and it only required a second or two to grasp the catheter and push it through into the duodenum and thus demonstrate the patency of the opening without running the risk of peritonitis which accompanies an incision into the lumen of the stomach. Another advantage of the tube is that much of the barium is expelled through it. Since these cases are quite tedious in their after feeding, it would seem best to remove any foreign substance from the intestinal tract.

The muscular coat of the pylorus on the duodenal side is very thin, and Lewisohn, of New York, has emphasized the danger of opening the duodenum in these cases on this account. He suggests that all dissection be begun from the stomach end where the muscular coat is much thicker so as to avoid entering the mucous membrane. A very slight perforation will cause leakage which may result fatally.

Alfred A. Strauss, of Michael Reese Hospital, has devised a very ingenious but rather complicated procedure. After splitting the muscle as described, he grasps the edges of the split tumor with the thumbs and index fingers and spreads it apart. This provides an efficient and safe method of separating the last muscle fibres near the mucosa. In addition he carries the cleavage, by blunt dissection, along the submucosa and shells out considerable of the mucosa. The next procedure he employs is an undercutting of the muscle tumor to form a flap which is turned back and sutured over the shelled out mucosa. Personally I do not see the necessity for the last procedure and it certainly requires longer to complete the operation in that manner.

One thing of value which has not been mentioned is, after the mucous membrane has bulged freely into the wound, to place a small section of omentum over the wound. This will protect against the possibility of leakage and also help to prevent undesirable adhesions.

James W. Bruce: I would like to say a few words about the diagnosis of congenital hypertrophic pyloric stenosis: I believe that a breast fed baby less than two months old with vomit-

ing projectile or forceful in type should be considered as a probable case of congenital hypertrophic pyloric stenosis. That may seem a rather strong statement to make, but I think the majority of them will be found to be pyloric stenosis, and many times the disease is allowed to progress too far before operation is performed.

I saw the little patient mentioned by Dr. Smith in consultation with him, and when we first saw the child it was six or seven weeks old. The baby at that time was the picture of starvation, constipated and losing weight. It was vomiting persistently but not forcibly. Three weeks later projectile vomiting developed, and Dr. Smith then looked for the other typical signs of this condition—increased peristalsis and tumor—and found them present. He then had a roentgenographic examination made which showed marked retention of bismuth after a long period of time.

With especial reference to the introduction of bismuth and the x-ray examination in these cases: I feel that the diagnosis can be very readily made without the aid of the roentgen-ray. Moreover I think the introduction of a large amount of bismuth into the baby's stomach is more or less risky. If you put two ounces of breast milk into the baby's stomach and three hours later introduce a stomach tube and recover any of this milk, that is evidence of retention which is just as conclusive in my opinion as determination by the x-ray and there is much less risk to the patient.

Goldbloom has recently analyzed one hundred and eighty-six cases operated upon by Downs at the Babies' Hospital, New York, in regard to the prognosis, and his findings are rather interesting: He finds that babies who have had symptoms for less than four weeks have three times the chance of surviving than those have who have had symptoms for more than four weeks. He finds that breast fed babies have three times the chance of surviving than bottle fed babies have. He finds that a baby weighing more than seven pounds at the time of the operation has three times the chances of surviving that a baby has weighing less than seven pounds. He makes the statement in conclusion that babies who have vomited for less than four weeks, who are breast fed, and who have not lost more than twenty per cent of their original weight, may be operated upon with mortality practically nil.

Dr. Anna McKamy (of New Albany, Ind.): When I first saw the baby referred to by Dr. Sherrill there was projectile vomiting. The child had some elevation of temperature and had not been nourishing well. Increased peristalsis was quite noticeable and examination revealed an enlargement in the pyloric region. The diagnosis of pyloric stenosis was accordingly made.

The child had a pulse of about 170 when op-

erated upon. He came off the table in much better condition than when placed on the operating table. Small quantities of water and milk were given immediately after the operation and retained. Convalescence was uneventful.

P. F. Barbour: I had the privilege of seeing this little patient through the courtesy of Dr. McKamy. The diagnosis of pyloric stenosis at that time was rather easy. A distinct mass could be palpated in the pyloric region. I sent the patient back to Dr. McKamy with the suggestion that she try the use of atropine for a few days and if there was no improvement then operation would be necessary. This plan was followed without the production of relief, and operation was then performed as outlined by Dr. Sherrill.

I think the most of us shrink from advising operation on a child six weeks of age; there is great danger of fatality from the shock of the operation. It is not always easy to decide in the beginning whether these children are suffering from pyloric stenosis or pyloric spasm. It makes considerable difference to the child which of these two conditions is present. Always in these cases where there is projectile vomiting one should try thoroughly atropine or belladonna to determine whether there is a true hypertrophic stenosis or spasm. I believe some of these cases at least start as spasm. Some of them are wholly hypertrophic, and some of them are mixed.

In this connection I am reminded of a case which came under my observation some time ago where the symptoms presented closely simulated pyloric stenosis, and three or four of us who examined the child thought very seriously of advising operation. In that case atropine was pushed to tolerance, skimmed mother's milk was given the child which stopped the trouble entirely, and the baby made a complete recovery without operation. The mother had an abundance of milk which was withdrawn from the breast and skimmed; the baby was fed this skimmed milk with the result stated.

There are certain things about these cases which make us consider operation. First of all is the presence of tumor in the pyloric region. When a tumor can be felt the case is usually one for operation. In the next place projectile vomiting would indicate that there is something more than simple spasm of the pylorus. Third, the presence of a marked peristaltic wave is a very characteristic symptom of pyloric obstruction. This was beautifully illustrated in a case which recently came under my observation. Fourth, constipation is a symptom which should be given due consideration. Where the child is passing normal stools there must be an opening through the pylorus. If the stools are characteristic "starvation stools"—dark greenish in color, mixed with mucous without evidence of the pres-

ence of milk—then we know that obstruction is practically complete. Fifth, another symptom of importance is the quantity of urine passed. Sometimes these children with marked pyloric stenosis will have the urine reduced almost to the vanishing point. This is a strong argument that fluid is not getting into the intestinal tract.

Since the Rammstedt operation has been perfected and can be performed within a few minutes, I believe we can take a little more chance and turn these patients over to the surgeon promptly. When gastroenterostomy was in vogue, as this is a much more serious proposition than the Rammstedt operation, it was a question whether we should run the risk of operation, because in the best hands gastroenterostomy gave the child only a little more than a chance of fifty per cent of getting well.

Louis Frank: I would like to call attention to one or two points in connection with hypertrophic stenosis of the pylorus: The first thing to be borne in mind, and this is important in the diagnosis, is that these cases almost always occur in male children; the vast majority of them are found in male children. Another thing is, that if we wait until late symptoms have developed, such as projectile vomiting, marked peristaltic movement and progressive loss of weight, then we are going to wait too long, whether marked stenosis is present or not, for a low mortality. Operation in the late stages is attended with a high death rate.

Careful study of Downs' statistics will show that the group of cases with high mortality are the ones operated upon late, cases admitted to the hospital with scanty urine, marked emaciation, projectile vomiting, and other indubitable evidence of pyloric occlusion. Given a child which has at first nourished well, that has reached the age of four weeks and begins vomiting food at each feeding, it should be looked upon with suspicion as being a case of hypertrophic pyloric stenosis. If vomiting continues and becomes projectile the case should be looked upon as almost surely one of such character.

I am in hearty accord with the other speaker who says it is not necessary in these children to make a roentgen-ray examination. I think it adds to the risk and entails some loss of time. It is all very well and nice to verify our diagnosis and complete the record, but it is not necessary by any means.

If we insist on the finding of a palpable tumor in the pyloric region to make the diagnosis of these cases we will often be mistaken. Downs has shown in some of his operative cases that the pyloric tumor was so situated under the edge of the liver that it could not possibly have been felt by abdominal palpation. Therefore the absence of palpable tumor should not be given too great diagnostic significance.

The Rammstedt operation is very simple and easy of execution. The error which has been made by practically all the men who have not seen any number of these cases is they have attempted to improve upon the operation by practicing dilation of the pylorus. As their experience has increased this has been found unnecessary. This also applies to the use of fat, of the omentum, of the introduction of tubes through the pylorus, etc. These procedures require time and have been found unnecessary. All of the men who have seen numbers of these cases have returned to the simple operation of separating the muscularis down to the mucosa leaving the pyloric incision open. Of course the mucosa should be separated from the muscularis for the required distance to insure patency of the pyloric lumen. Nothing else is required.

In a few cases where the mucosa has been injured it has been sutured with no bad effects, and these children have shown none of the consequences that we have been led to fear as a result of adhesions over the pylorus in the region of the incision.

If I remember correctly Downes called attention to a few cases seen three or four years after operation in which the pyloric tumor was still present, that is no re-development had taken place in the musculature though the tumor had not disappeared. My attention was first called to this character of stenosis by Keefe in a paper which he read in 1910. At this time the operation in vogue was gastroenterostomy and the mortality was very high. I think Downes' mortality in his first thirty cases was something like thirty-five per cent. In his later cases, however, doing the plain Rammstedt operation, the mortality was materially reduced. He explains the high death rate in his cases by stating that many of the children came to operation late in the course of the disease. His report before the Southern Surgical Association, in his first series of cases treated by the Rammstedt operation, showed a mortality of about twenty per cent. On the other hand, Keefe's latest series of cases treated by the Rammstedt method shows almost uniformly successful results. These two gentlemen, Keefe and Downs, have published statistics which are extremely interesting.

I think the most important points are to make the diagnosis as early as possible and refer the patient to the surgeon for operative treatment: Not to waste time by making extensive x-ray studies which can only serve the purpose of verifying the diagnosis: When the diagnosis is once made time should not be wasted in futile medication: The passage of tubes to prove patency of the pylorus may increase the swelling and edema thus causing more marked obstruction.

All of these cases probably show some improvement following gastric lavage, but the relief thus obtained is only temporary and may be the means of delaying operation to the point of greatly increasing the danger to the patient.

With proper interpretation of the early symptoms a great many more cases of congenital hypertrophic pyloric stenosis will be observed in the future than have been noted in the past.

L. Wallace Frank: Dr. Smith mentioned the name of Strauss, of Chicago, in his discussion. In a recent paper Strauss reported one hundred and seven operative cases of congenital hypertrophic pyloric stenosis with only three deaths, a mortality of less than three per cent. In a personal talk with him, if I remember correctly, he attributed his success in these cases to the fact that they are given bicarbonate of soda by the rectum before operation to combat the acidosis resulting from starvation, and also the speed with which the operation he has devised can be performed. Instead of using a scalpel to separate the musculature, which is essential to a successful operation, he peels the muscle from the mucosa with his fingers. This takes less time than separation with the scalpel, and he attributes his low mortality to the speed with which this can be done and the fact that soda is administered to these starving children prior to operation.

H. M. Rubel: It would appear that there has been an epidemic of pyloric stenosis in this vicinity. There have been two cases at the Childrens Hospital within one week recently. One of the patients was referred by Dr. McKamy, of New Albany, Indiana. This patient was fourteen weeks old when admitted, he had projectile vomiting, typical peristaltic movements, a distinct mass, and other characteristic signs of pyloric stenosis. The history showed that symptoms began when the child was about five weeks old. There was considerable emaciation and the child was a bad surgical risk at the time. Operation was performed promptly but the child died within ten days.

I believe fluoroscopic examination is about the most important means we have of arriving at an accurate diagnosis, and deciding for us almost at once whether the patient should receive surgical or medical treatment.

J. G. Sherrill (closing): I think the profession is agreed on this condition more than any other that I know in the practice of medicine, i. e., that as soon as the diagnosis of congenital hypertrophic pyloric stenosis is made the patient should be subjected to operation.

There is no satisfactory medical treatment, the administration of belladonna is for the purpose of determining whether there is hypertrophic stenosis or pyloric spasm which sometimes produces symptoms similar to those present in

congenital hypertrophic stenosis. I do not believe operation should be delayed after the diagnosis is made.

I must say that as a safeguard we should subject these patients to roentgen-ray examination. The introduction of Bismuth causes no injury whatever to the child, and differentiation between hypertrophic stenosis and spasm can easily be made by this means. Pyloric spasm cannot continue over a period of many hours, the muscle must become relaxed and allow the gastric contents to pass onward.

The point mentioned by Dr. Bruce, i. e., giving the child a certain amount of fluid and later withdrawing practically the same quantity is **proof** positive of gastric retention. The next thing to determine is what causes the retention. The presence of a tumor in the pyloric region is not necessary to perfect diagnosis although it is a valuable sign when present. The presence of a palpable tumor is a certain diagnostic sign and indicates the type of stenosis with which we are dealing.

These little patients should not be allowed to progress to the point of starvation before diagnosis is made. I am familiar with one of the cases mentioned by Dr. Rubel seen at the Childrens Hospital, the child had vomited persistently for several weeks, emaciation was extreme, and the result was not unexpected. The child withstood the operation very well and never vomited afterward, but the high temperature continued due probably to starvation, and there was no response to after treatment.

The symptoms in congenital hypertrophic pyloric stenosis are classical, and when the diagnosis has been made immediate operation offers the best results.

Duodenal Diverticulum.—The patient whose history is given by Dean Lewis, Chicago (*Journal A. M. A.*, March 19, 1921) suffered at times from severe pain and tenderness, localized just below the costa lmargin on the right side. The pain simulated more closely that of gallstones than stomach ulcer. The symptoms were not suggestive enough of ulcer to warrant fluoroscopic examination. The severe pain was completely relieved by operation.

Alimentary Disease of the Bone.—Chelmonski writes from Warsaw to describe a number of cases of what he calls alimentary osteoporosis encountered during the German occupation, when famine reigned. There were two forms, one with pains and a flexible and fragile state of the bones; the other resembles more osteomalacia, although not connected with pregnancy, and the general health keeps good, and there is no deformity of the pelvis. Recovery is prompt when the patients can have repose and proper food.

BONE INFECTIONS.*

By BENJAMIN W. BAYLESS, Louisville.

The long bones are composed of a shaft or diaphysis and epiphysis at either end. The normal diaphysis consists of a medullary canal in which are the blood vessels, lymph vessels, nerves, and it also contains the marrow fat. The medullary canal is surrounded by dense bone or cortex which is covered by a fibrous sheath, the periosteum. The epiphyses are composed of cancellous bone and the part entering into the joint is covered with cartilage and synovial membrane.

Any part or structure of a bone may be the site of an infection. If the infection is limited to the medullary canal it is termed a myelitis, if limited to the cortex, osteitis and if limited to the periosteum, periostitis. An infection as a rule is not limited and may involve one or all of the structures. The infection may vary but the process is the same, varying only in severity and duration.

The infection may take place in one of the following ways:

1. Hematogenous or lymphoid.
2. Extension from a joint or soft tissue.
3. Direct inoculation as in wounds or compound fractures.

In the first way the infection takes place through the blood or lymph stream from a distant source and is carried through the nutrient canal into the medullary portion of the bone. The infection may extend throughout the length of the bone very easily and rapidly as there is no barrier in the medullary canal. The extension is slower through the cortex as it is dense and acts as a barrier.

Where the infection extends from the periosteum or the soft tissues it may be limited to the periosteum or it may extend deeper affecting the cortex and finally the medullary canal, but the extension in this direction is slower than if it started in the medullary canal and extended outward as then it extends through the Haversian canals which are the natural channels for the supply of the bone. If the infection extends from a joint, there is great destruction of the articular surface and the adjacent cancellous bone, but the extension into the medullary canal is usually slow.

In direct infection from wounds or compound fractures the periosteum, cortex and medullary canal may be infected at the same time.

The sources of the infection which take

place through the blood or lymph stream are the teeth, tonsils, gastro-intestinal tract and sinuses.

In every infection of bone two processes take place—destruction and reproduction. Destruction occurs first and reproduction follows but not until the infection has been overcome; these two processes may go on at the same time, breaking down at one place and building up at another. This reproduction is not uniform and the bone may become very irregular. The reproductive process is one of nature's ways of limiting the infection and is always at the margin of the infective area. The bone reproduction is not seen as much in an acute infection as in chronic and much more in some chronic cases than others.

In the early stages of an infection of a bone the process is always a destructive one, the bony elements are disintegrated and destroyed. The first changes in the bone are not shown by the roentgen rays but as the infection progresses and extends the destruction becomes apparent and then marked changes are shown on the plate. There may be pus in an acute process, yet it does not show because pus and marrow are the same density and what really shows in the bone destruction or disintegration.

In an acute case of osteomyelitis the infection is usually hematogenous and starts in the medullary canal and as it extends along the canal you see areas of destruction which show on the plate as dark areas surrounded by normal bone. These areas may break down forming large cavities or the blood supply to the healthy areas will be cut off and a sequestrum will form which shows by its irregular outline and denser appearance. The process extends to the cortex through the Haversian canals and areas of the cortex may become cut off and form sequestra. In the medullary canal there is very little resistance to the progress of an infection but it may be limited forming a localized abscess. In the cortex the extension is slower and more limited, especially by new bone formation at the edge of the infection which has caused a stimulation of bone reaction. In acute osteomyelitis there is a great deal of bone destruction and very little new bone formation and the extension is rapid. In chronic osteomyelitis there is some bone destruction and a great deal of regeneration which may be adjacent. When the infection is limited by the periosteum there is extensive periosteal bone formation giving the bone a thickened appearance which is really a thickening of the cortex. The medullary canal may appear obliterated due to bone formation within the cortex. The bone may

*Read with lantern slide exhibit before the Louisville Medico-Chirurgical Society, March 11, 1921.

become very dense and irregular in shape. Sinuses may lead from sequestra or an infected area in the bone. The outlines of the cavities in chronic conditions are sharp while those in acute conditions are indistinct. If the infection extends throughout the bone, the entire shaft may form a sequestrum and the dense new bone surrounding it forming an involucrum.

In a beginning tubercular infection no changes in the bone show on the x-ray plate, but as the process extends the first noticeable change is atrophy of the bone which is not limited to the site of the infection and gradually becomes very marked and at the same time destructive areas show. The atrophy becomes more or less general in the infected bone and the adjacent bones; this atrophy of the adjacent bones is due to non-use unless the process has extended to them. The process is a destructive one and nature is slow in establishing a barrier and very little regeneration is seen as compared to chronic osteomyelitis. The infection is seldom limited to one structure but involves all, and sequestra and sinuses are frequent. In healed tuberculosis the bone becomes denser than normal as in osteomyelitis.

Osteoarthritis or hypertrophic arthritis does not show in the acute process but only after it becomes chronic and then a lipping or spur formation at the various articulations and in the ligaments. The process may be so extensive, as in arthritis deformans, as to completely destroy the function of the joint.

Syphilis shows as osteomyelitis or osteitis and is usually of the chronic type. There may be small areas of destruction, but as a rule there is more bone formation and it is more regular in character than in pyogenic infection and shows as subperiosteal bone formation and is comparatively smooth, the bone showing a very dense and thick cortex. The shaft is involved more than the epiphysis and the infection is usually multiple involving more than one bone.

DISCUSSION

W. J. Young: I want to compliment the essayist on the modest way in which he has referred to the roentgen-ray as an aid to the diagnosis of bone infections. I know that syphilis certainly plays an important part in the diagnosis. When the Wassermann is negative and in the absence of indicative clinical symptoms the roentgen-ray will sometimes show a lesion which we suspect is luetic in origin, and the therapeutic test demonstrates that the lesion is syphilitic.

I want to agree with what the essayist has said about bone tuberculosis: He emphasized a point that I think the average radiographer does

not often appreciate, that is that the diagnosis can be made before the lesion will show on the radiographic plate.

J. G. Sherrill: Dr. Bayless has opened a very productive field for discussion. I think we can readily understand that where the bone has been extensively injured the patient may escape osteomyelitis because the avenues of infection are blocked by the inflammatory exudate. One reason why there is a great amount of destruction of bone in acute infections is because bacteria are carried into the vessels of the bone. These vessels are often terminal vessels and immediate reaction occurs causing marked engorgement. Swelling is a prominent factor at the beginning of bone infection because it is united by the dense covering of the bone and necrosis is likely to occur if the tension is not relieved. The best method of treatment is immediate opening, thus relieving tension and permitting free drainage.

In the osteomyelitis seen in children the parents often state that the pain developed suddenly and appeared to be most severe near the joint. These cases are due as a rule to focal infection somewhere in the body, the bacteria being carried through terminal arteries to the cancellous tissue of the bone. The invading organism is generally the streptococcus, or there may be mixed infection, with destruction of a great amount of tissue. These children often have a high degree of sepsis and may die before the diagnosis can be made. Sudden pain in the extremity of the bone with high fever in children should immediately call attention to the fact that there may be infection of the bone, an osteomyelitis or osteitis.

Before we had the diagnostic aid of the roentgen-ray it was common to see discharge sinuses in limbs with exuberant granulations around them. These signs were almost proof positive of a foreign body embedded in the tissues, usually a fragment of bone, causing the inflammatory process to persist, and until the foreign body was removed the patient did not get well.

The roentgen-ray has been of the greatest advantage to the surgeon in every field, and particularly in bone surgery, and it is by co-operation between the student of surgical lesions and the roentgenologist and by co-operation between the internist and the roentgenologist that we are going to develop this field to the greatest extent. The more familiar a man becomes with the reading of x-ray plates the more value he will have as a clinician and the more accurate he will be in diagnosis. I believe everyone ought to understand how to read and interpret roentgenographic plates, and in that way many errors in diagnosis might be avoided. The surgeon is sometimes misled by the radiogram because of

lack of proper understanding. If we do not know the normal we cannot understand the pathological. Therefore we should always carefully observe these cases, and every paper of this kind is of interest and should be productive of great good.

NON-UNION OF ABDOMINAL WOUND*

By M. CASPER, Louisville.

The title of this case report would probably be more correctly stated as, "Delayed Union of Abdominal Incision."

Case: Mrs. F. S., New Albany, Ind. Widow 54 years of age, usual weight 130 pounds, over weight of 37 pounds at the time we first saw her, January 1st, of this year.

Family history negative, although father died of tuberculosis of the throat. Menopause four years ago. She is healthy except "female trouble" and nervousness, also backache. Constipation marked. Has shortness of breath and says pulse rate is always too rapid. Has tremor and headache. Complains of swelling of feet and gangrenous infected spot on right heel, which she says is due to frost bite. Has a few dead teeth. Suffers with indigestion, gaseous distension, belches gas and sour stomach immediately after and sometimes even while eating.

Examination: Patient presents anxious look with slight exophthalmos, although pulse rate and blood pressure are negative to the Goetsch adrenalin test. Diastolic pressure 100 M. M., systolic 140 M. M. Wassermann negative. Urine negative to albumin and sugar.

Vaginal examination: Has history of drainage of pelvic abscess through vagina several years ago. Speculum revealed growth protruding from cervix, (submucous fibroid with possibly early malignancy in mind, also fibroid of uterus. Infected gall bladder and chronic appendicitis also entered into diagnosis.

Operation: Complete hysterectomy, many adhesions and evidences of old pus tubes broken down and cysts of ovary.

Microscopical diagnosis by Dr. Stuart Graves: Leiomyoma (no evidence of malignancy) chronic atrophic endometritis, chronic salpingitis, healed appendicitis, cysts of ovary.

Operation on gall bladder was deferred on account of patient's inability to withstand shock, although she came off the table in good condition. Abdominal wound closed in layers: peritoneum plain catgut No. 1, muscle plain catgut No. 1, fascia double chromic

catgut No. 1, skin plain catgut, two stay sutures of medium silkwormgut were inserted down to and including fascia. Incision was three inches long through right rectus muscle.

Post-operative history: Patient had not a single untoward symptom, not even elevation of temperature until on the sixth day when she had an "uneasy feeling" after she used the bed pan during the night. Patient says she did not strain unduly when using pan and had not coughed or sneezed. A considerable serious oozing had come from wound, seeping out under the adhesive plaster the next morning.

Examination revealed a loop of small intestine about six inches long protruding through wound and firmly adherent to gauze dressing. When questioned closer patient had no bad symptoms except slight nausea on way to the operating room.

Under ether anesthesia the two stays, which had remained intact, were removed and wound fell apart. There had been no union, except there seemed to be a slight sticking together at each end. The intestine had herniated between the two silkworm stitches which were about an inch apart. The continued fascial chromatized catgut suture had given away in the middle and was holding in each end of fascial slit. The mesentery was very much constricted and the intestine edematous, and its surface showed the imprint of the gauze dressing with which it was in contact.

The intestine was replaced and omental graft placed over roughened surface, and wound closed very much like the first time, except more silkworm sutures were applied with figure of eight bites into fascia. The wound was dressed with hot compresses and thoroughly iodized, although there was positively no sign of pus or infection. Patient made an uninterrupted recovery after second closure.

Comment: Considering this patient being rather robust, free from syphilis and diabetes with no wound infection, acidosis or local anesthetic used, and no undue straining, we are at loss to account for this peculiar condition. If catgut was weak or defective, being double it must give away in both strands.

We had one other such case, several years ago, in an old asthenic, emaciated, acidotic patient, where we did a gastroenterectomy under local anesthesia for pyloric stenosis and duodenal ulcer. We certainly had plenty of contributing causes in this patient, although withal this wound too remained free from infection.

DISCUSSION

A. D. Willmoth: Dr. Casper's case is interesting and one of a character that is sometimes

*Read before the Jefferson County Medical Society.

seen by the surgeon. It is very embarrassing to operate upon a patient, close the abdominal wound and apply the dressing, and a week afterward find that the wound has not united. The wound looks like it is clean, there is no infection, the edges may appear "glued together," but when the retention sutures are removed, whatever the material may have been, whether catgut, silkwormgut or silk, the surgeon finds very much to his surprise that the wound "falls open while he is looking at it." In many instances the accident happens just as it did in Dr. Casper's case, the patient sneezes, coughs, or strains during defecation, and the small intestine appears in the wound under the dressing.

I have seen a fairly large number of these cases and have had many of them examined, and am firmly of the opinion, as many others are, that these cases are like ununited fractures, they are all syphilitic. It will be found that nearly every one of these patients will show a positive Wassermann reaction. It is immaterial, however, whether the Wassermann is positive or negative, because there are many other things to be taken into consideration. The most important item of all is that these patients get well under active antisyphilitic treatment. While Dr. Casper states that his patient did not have syphilis, the Wassermann being negative, I still maintain that it was a case of syphilis. I furthermore believe that the perforated sore on the patient's heel was a syphilitic lesion.

I have recently been very much interested in the question of syphilis of the stomach, and believe there are many more cases of this kind than we have hitherto thought. In Dr. Casper's case the patient complained of an acid stomach, and whether she presented any clinical symptoms or not, I strongly suspect the gastric symptoms are due to syphilis.

Accidents of the kind described occasionally happen to all of us who are doing surgery, and where there is non-union of the abdominal wound, where the wound is clean and there is no infection present, according to my judgment these are all syphilitic cases.

J. G. Sherrill: The gentleman who has discussed this case seems to have overlooked a very important point, i. e., if the patient had syphilis and that was the reason why the abdominal wound did not heal the first time, why did it heal after the second closure? I understand no antisyphilitic treatment was administered at any time.

There are many things which may interfere with wound healing. First and most important is infection, and this of course would include syphilitic infection. The wound may be closed in such manner as to cause a dragging on the tissues and thus prevent healing.

In the case reported I believe the reason the

healing of the wound did not occur after the first operation was because the catgut was absorbed too quickly. There are so many different varieties of catgut and possible imperfections in manufacture that it cannot always be relied upon. It seems to me, in view of the fact that this wound healed promptly after the second closure, there must have been some weakness in the catgut, or it was absorbed too promptly, and that under the tension from vomiting there was separation of the peritoneal surfaces, and after they separated it was easy enough for the intestine to be pushed outward by internal pressure, and further separation of the wound then occurred.

I am inclined to believe that the cause of this condition was mechanical. I met a similar case where the patient suffered from jaundice of marked type, pancreatitis, stricture of the common duct, and there was a great amount of ascitic fluid in the abdominal cavity. Under tension of this fluid there was absorption of the catgut sutures and the wound separated. As soon as this became apparent the wound was again closed with larger and stronger catgut. The patient had no further trouble and recovered within a few days. So I know it may occur from mechanical causes.

For a number of years I have not used a smaller sized catgut than No. 2 chronic to close muscles and fascia. I have seen several accidents of the character Dr. Casper has described where small catgut was used. Since adopting the larger catgut I have practically abandoned the use of stay sutures unless the wound is large and very long.

George A. Hendon: I cannot recall ever having observed a condition like that described by Dr. Casper in his report except in wounds which involved the area above the umbilical line. In operating upon gastric lesions by gastroenterostomy for instance, where a vertical incision is made through the rectus muscle near the ribs, everybody knows that it requires at least three weeks to secure union; and for that reason I think it is very hazardous to rely on catgut alone for the closure of wounds in that particular location. It seems the reason for this uncertain union is the constant motion that is imparted by the diaphragm.

I had one case in which I had performed gastroenterostomy and the wound opened three weeks after the operation and required resuture. On that account many surgeons use silver wire for closing wounds in this particular region.

I am inclined to agree with what Dr. Sherrill has said about cause of the non-union in Dr. Casper's case. If syphilis prevented healing of the wound the first time, it would certainly have prevented it from healing after the

second closure. I believe failure of the wound to unite was due to fault of the catgut. I would say, as a warning, that I think it is important in closing wounds above the umbilicus to introduce stay sutures of silkwormgut or silver wire and allow them to remain at least twenty-one days.

C. M. Casper (closing): In regard to the patient being a syphilitic: I was at first inclined to think that syphilis was the cause of the non-union of the wound. I have seen some wounds which did not heal in syphilis and this looked very much like them. However, this woman had a Wassermann test made two years ago in the Jefferson Hospital, Philadelphia, which was negative, and another test was made recently with negative findings.

The lesion on the patient's heel I am certain is not syphilitic. It does not look like a serpiginous ulcer, furthermore she had a corresponding ulcer on the opposite heel which has healed, so this one is likely of the same character. She has no glandular enlargements or any other evidence of syphilis that I can find. She has no throat trouble, no falling of the hair, and no other symptoms that one could describe as being syphilitic.

As to the comments made by Dr. Sherrill and Dr. Hendon about catgut: I hardly believe that could have been the cause of the non-union. I used the same grade of catgut the second time as was used in the first operation. The wound was closed in the same way except that I used a few extra stay sutures the last time. The catgut was part of the same bunch. It was kept in chloroform solution and has been found satisfactory in every way. The catgut did not look like it was absorbed, because the strands on each end were intact, only the middle loop having separated. The sutures were double and properly introduced.

I am in great doubt as to why the wound did not heal after the primary operation. The patient had some focal infection which I think had nothing to do with it because there was no evidence of infection in the wound. The temperature curve showed no elevation at any time. There might have been some organism of a putrefactive nature in the wound, but I hardly think so.

The case shows how sometimes abdominal wounds refuse to heal. On the contrary, other similar wounds will sometimes withstand great strain even though healing may not be perfect at the time. I remember when I was interne in the Louisville City Hospital having performed abdominal section on a young woman. Four or five days afterwards she had mild delirium and jumped from the second story window, landing on a pile of brick. The abdominal wound was

examined and found just as perfect as it was when she left the operating room. This shows what great strain the abdominal wound will sometimes stand.

RUPTURE OF THE SPLEEN: SPLENECTOMY. CASE REPORT *

By GUY P. GRIGSBY, Louisville.

The patient before you, H. K., a male, aged thirty-six years, a Swiss by birth, and a wood carver by trade, was admitted to the Jewish Hospital on May 2nd, 1920, because of abdominal injury sustained by being kicked by a horse. His previous history is negative with the exception of typhoid fever when ten years of age. He was severely burned about the arms and body five years ago.

Present injury: Fourteen hours ago he was kicked by a horse, being struck twice on the abdomen; once in the upper portion, and again in the left lower quadrant. There was some pain following receipt of the injury, but the patient did not realize he was severely hurt and attended to several duties about the barn before being compelled to go to the house on account of severe abdominal pain.

He was kicked about eleven o'clock in the morning, and sat up most of the afternoon. Pain became so severe about five o'clock in the afternoon that he called Dr. Hollingshead to see him. In the meantime he had two alvine evacuations and thought he had passed considerable blood-stained fluid each time. Dr. Hollingshead at once realized that the man was in a desperate condition and immediately took him to the Jewish Hospital where I was asked to see him. I found him sitting up in bed, and it was quite apparent by looking at him that he was in great distress and deep shock.

Examination: Pulse 112, temperature 96.4° F. The abdomen showed no evidence of external injury. It was apparent that the abdomen was distended with fluid. Pain could be elicited only over the left iliac region. Any attempt to induce him to lie down met with frantic resistance, the patient saying that it caused intense pain in both shoulders, particularly marked in the right. Rectal examination disclosed no free blood in the rectum.

In view of the history, the eliciting of pain in the left iliac region, and the fact that the patient had passed considerable blood by rectum, we suspected injury of the descending colon; at any rate we concluded immediate celiotomy was indicated, and he was taken to the operating room without further de-

*Clinical report with exhibition of the patient before the Jefferson County Medical Society.

lay. It was necessary for Dr. H. M. Rubel to anesthetize the patient while sitting on the operating table, as he could not be induced to lie down on account of the pain.

A median incision below the umbilicus was made. Immediately upon opening the peritoneum there escaped half a gallon of fluid blood, but as there was no evidence of feces and no odor we concluded there was no injury to the intestine. During the space of a few seconds the hemorrhage was so terrific and persistent that I realized it was coming either from the liver or spleen, and without hesitation I immediately enlarged the incision to the ensiform cartilage. The patient was completely eviscerated and this procedure was completed almost as quickly as it takes time to tell it. This enabled us to determine the source of the hemorrhage.

The lower end of the spleen seemed to have been entirely "blown out" and a terrific hemorrhage was occurring from it. The patient's condition at this juncture was most grave and Dr. Rubel thought he would die on the table. Very fortunately I was able with my left hand to grasp the pedicle of the spleen and by firm pressure control the hemorrhage. Further inspection showed that the spleen was split into three portions, the ruptures extending into the pedicle. The organ was three or four times its normal size and rather densely adherent to the parietal peritoneum from which considerable effort was required to free it. The spleen was then brought through the incision, the pedicle clamped with forceps, and the organ removed. The pedicle was ligated with chromic catgut and examined to see if all hemorrhage had been controlled, then allowed to recede into the abdomen. The viscera were replaced and the wound hastily closed without drainage.

The patient's condition at the close of the operation was extremely grave. He was given a saline transfusion which to some degree restored the pulse. The following morning a suitable donor was found and he was given 600 c. c. of blood. Unquestionably this turned the tide as there was marked improvement in his condition following the transfusion.

Convalescence was uninterrupted except for a small stitch abscess. The patient was dismissed from the hospital on the twentieth day after the operation and was in good condition. Two or three blood examinations were made by Dr. Morris Flexner while the patient was in the hospital and practically normal findings reported.

I have not seen this man since he left the hospital until now. He says he has enjoyed perfect health since the operation, that he

has been working regularly, and has gained twelve pounds in weight. Except for an occasional pain in the shoulder he has had no discomfort. His appearance indicates that he has an abundance of blood.

An interesting point about this case which has been noted by other observers, is that while injury to the spleen may be serious, rarely are grave symptoms noted at first. The symptoms appear gradually and within a few hours after injury become pronounced just as happened in this case. Persistent pain in the shoulders is not a prominent symptom in every injury of the spleen but has been noted by other surgeons.

The fact that this patient complained of pain in the left iliac fossa and had passed blood with the alvine dejecta led us to suspect injury of the descending colon.

DISCUSSION

L. W. Frank: It has been my privilege to have operated upon three patients for ruptured spleen. As Dr. Grigsby has stated, it is rather characteristic that the severity of the early symptoms is no indication of how extensively the spleen is injured.

The first case I saw was a rather stout man who was riding in an automobile. The machine turned a corner rapidly and he was thrown against the side of the car sustaining a rupture of the spleen. He was operated upon a week later. He had a mass of clotted blood in the abdominal cavity evidently from an acute hemorrhage at the time of the accident. Later during defecation he had a secondary hemorrhage and was brought to the hospital and operated upon. In the other two cases the diagnosis of ruptured spleen was made promptly and both patients subjected to immediate operation. The first patient died, the other two recovered.

One of the rather characteristic points in the diagnosis is tenderness at the costo-vertebral angle on the left side with no blood in the urine. Of course the patient has the usual symptoms of hemorrhage, but the signs develop slowly in many cases. There is a definite increase in leucocytes, the count being usually from 18,000 to 20,000. This is an important symptom and indicates intra-peritoneal hemorrhage. The facts that there are present symptoms of intra-peritoneal hemorrhage, with tenderness over the left costa-vertebral angle, with no blood in the urine, should make one suspicious of rupture of the spleen. Pain in the shoulder occurs in quite a number of cases as Dr. Grigsby has said.

C. G. Forsee: One point about injuries to the spleen: I have seen in the Louisville City Hospital three patients with gunshot wounds

of the spleen and of course hemorrhage was profuse in all of them. These were complicated by perforation of the stomach. In these three cases drainage was used. The fact is worth remembering that the drainage tube can be safely removed within the course of a few hours, if the hemorrhage has been controlled, because the spleen unites quickly. The spleen will heal perhaps more quickly than any other organ of the body and the necessity of leaving the drainage in these cases is reduced to the minimum for that reason. In view of this fact the packing or drainage should be removed within the course of a few hours.

CASE OF ENCEPHALITIS LETHARGICA COMPLICATED BY LUES AND GOITER*.

By W. E. GARDNER, Louisville.

Miss H. S., admitted to sanitarium January 1, 1920; single; occupation, stenographer; age twenty-two years. Father living, health good, aged fifty; mother living, aged forty-eight, health good. Four sisters living, all in good health, except two show enlargement of the thyroid gland. No history of mental or nervous diseases in the family. Two brothers living, good health; three brothers dead.

The patient had been well all her life, except for the usual diseases of childhood and an attack of diphtheria at five years of age, which left her slightly deaf. No history of any previous nervous trouble, tuberculous, venereal disease, drug addictions, or alcoholism. No menstrual disorder.

About the middle of last November, after returning from a week's stay at French Lick, the patient was quite drowsy and slept a great deal during the day and always well at night. She had some fever at that time which was thought to be due to a cold. Drowsiness increased gradually, and the patient soon complained of double vision, but the fever attracted little attention and a physician was not even called.

The patient slept almost continuously day and night during December, but had no headache or pain of any sort, and her condition did not cause any anxiety until the latter part of December when she began to grow rather weak and talked a little incoherently at times. I was called to see her in reference to coming to the sanitarium for treatment, and a tentative diagnosis of encephalitis was made. She was admitted the next day.

Physical examination showed a fairly well nourished young woman, with facies indicating that she was somewhat younger than the age given. No evidence of any stigmata of degeneration. Pupils equal in size, regular in outline, and responded to light and accommodation. No nystagmus, ptosis or squint. No diplopia at this time or evidence of weakness of the ocular muscles. The patient was quite drowsy during this examination and would go to sleep as soon as questions ceased. There was marked enlargement of the thyroid gland involving both lobes which were fairly symmetrical. Pulse 110; blood pressure 120-80. No tumors or exophthalmus. The thyroid enlargement had been noticed for the past seven years and had caused no discomfort or uneasiness. No history of easy fatigability prior to the present attack. Abdominal and tendon reflexes normal at this time.

Laboratory examinations revealed a four-plus Wassermann of the blood; with red cell count of 4,610,000, white cell count of 6,800; mononuclears 31; neutrophils 65; transitionals 3; basophiles 1. The specific gravity of the urine was 1025, with no albumin, sugar or casts; a few lymphocytes, squamous cells, and uric acid crystals; no bacteria.

The patient's eyes were examined by Dr. I. A. Lederman and found negative. Dr. Herbert Bronner was asked to see her on account of the positive leucic reaction, but readily concurred in the diagnosis of encephalitis and advised against the use of neoarsphenamin until the symptoms had improved. He did advise, however, that mercury salicylate be given intramuscularly, and the administration of the iodides in increasing doses. Dr. John J. Moran was also asked to see the patient on account of the presence of lues and hyperthyroid condition. He believed that the case was essentially one of encephalitis, and did not attach great importance to either the thyroid or the positive Wassermann, but heartily concurred in the antisyphilitic treatment. General tonic medication was also advised. Spinal puncture was not made.

About this time it had been noted that there was a weakness of the right leg, which began to appear at the end of the first week in the sanitarium, and had gradually extended to the right arm with slight involvement of the right side of the face. The tendon reflexes on this side now became exaggerated, with a transitory ankle clonus, which at times could not be obtained except when the leg was fully extended, indicating a clonus of the gastrocnemius muscle rather than of the soleus which is usually the one involved and which is obtained when the leg is flexed and re-

*Clinical report before the Louisville Medico-Chirurgical Society.

laxed. The right leg soon became spastic and rigid and could be passively flexed only, and this with considerable difficulty. The right arm remained weak but not so spastic as the leg. There were no athetoid movements on this side. The patient was now unable to walk and had to be assisted in and out of bed. By the middle of January the lethargic condition had begun to disappear, and the right-sided hemiplegia was now giving the most concern. The patient still slept well at night, she had no pain and slept little during the day, but had to be fed. There was little change for the next two weeks.

About February 1st, there appeared twitching and jerking in the left leg, and athetoid movements were noted in the left arm and hand, to the extent that the patient could no longer use the left hand which she had been able to do prior to this time. No spasticity or rigidity had been noted on this side, and the tendon reflexes have not been increased. There has been no ankle clonus, Oppenheim or Babinski. There was almost continuous flexion and partial extension of the left leg, which had to be held by a nurse to prevent chafing of the skin, and the leg had to be bandaged in cotton and gauze as a further precaution to prevent abrasions.

A mixture of sodium bromide, tincture of hyoscyamus and tincture of belladonna was prescribed to control these choreic jerkings and athetoid movements about February 10th, and little or no improvement was noted in this condition until February 20th, when the flexion and extension of the leg began to grow less, and the patient began to have some use of the left hand. The use of the right hand had begun to be resumed about two weeks prior to this, but the right leg still remained stiff until improvement was noted in the left side. In the meantime the general condition of the patient, both as to strength and weight, had improved considerably, and she was now bright and jolly always during the day and much amused at times by her peculiar condition.

Within the past few days there has been a rather marked improvement in the use of both sides of the body. The right leg can now be flexed and extended at will; the patient has very good use of her right hand, and is beginning to feed herself. The choreic movements in the left side have markedly improved and the patient is now getting fair control of the left hand and arm, and the left leg has become more quiet. It can also now be flexed and extended at will, whereas the movements until a week ago were entirely involuntary.

The ankle clonus in right leg can still be

obtained when the leg is fully extended, but there is no Oppenheim or Babinski on either side at this time, and all stastieity seems to be gradually subsiding. The patient feels much encouraged about her condition, and aside from a peculiar explosive sort of laugh and rapid enunciation of words, as if her teeth were being held together, she appears to be in a perfectly normal mental state.

Urotropin was used early in this case without any apparent benefit, and tablets of calceose were tried about the first of February at the suggestion of Dr. Moren, with little or no benefit that could be noted. Eight injections of mercury salicylate $1\frac{1}{2}$ grains each have been used up to this time, and saturated solution of iodide of potassium was given in increasing doses until a slight conjunctivitis developed, after which it was discontinued for a few days, and has since been given in fifteen drop doses without any disturbance of any sort.

On this date (February 25th, 1921,) the patient has been under observation for eight weeks, with a history of having had symptoms for six weeks prior to the time we saw her, making the case one of fourteen weeks standing. There has been no fever at any time during the past eight weeks, but there is still some diplopia at times without any ptosis or evident inequality of the external ocular muscles; but Dr. Lederman reports a slight weakness of one internal rectus at this time. The pulse now ranges from 100 to 110, and blood pressure 125 systolic, 70 diastolic.

DISCUSSION

John J. Moren: The case reported by Dr. Gardner presented the most interesting clinical picture I have ever seen; in fact, I have never seen anything just like it before in my life.

The question as to the diagnosis was raised: We all know that syphilis of the nervous system may produce a very irregular and unusual picture, and cases have been reported presenting practically the symptoms present here. In this instance we had a blood Wassermann of four plus, and the question naturally arose whether the patient had syphilis or encephalitis. Based upon the history which Dr. Gardner here detailed, I took the ground that there must be something else than syphilis to cause the symptoms; the manifestations made me think of encephalitis rather than syphilis of the nervous system; another thing, the rapid improvement of the diplopia in this case without treatment pointed to encephalitis. Usually in syphilis when double vision occurs it remains for a considerable time unless the patient is actively treated, and this girl had received no anti-syphilitic treatment at the time I saw her. The

diplopia disappeared to a great extent without leaving behind any irregularity of the pupil. Ordinarily cerebro-spinal syphilis giving rise to cranial nerve involvement leaves more or less irregularity of the pupil. That has not been noticed in encephalitis.

This girl had progressive lethargic symptoms and after treatment was begun she developed hemiplegia confined to the right side with choreic movements on the left side. There was practically no disturbance of the reflexes, with the exceptions noted by Dr. Gardner, which was a most unusual condition of affairs. Taking all these things into consideration, I was of the opinion that the case was one of encephalitis rather than cerebro-spinal syphilis.

In a recent number of *Brain* I noticed the description of a case which gave a clinical picture almost identical with the one Dr. Gardner has reported. There was the same spastic condition on one side with flexion on the opposite side. There was no explanation as to the localization, but the author regarded it as a lesion about the red nucleus of one side. The function of the red nuclei is not well known. My prediction is that several years from now, when a greater number of brains obtained post-mortem have been given to the laboratory for examination, we are going to know more about the function of different parts of the brain than we have ever known before. Possibly such examinations in encephalitis will give us information about areas of the brain of which we now know little.

Leon K. Baldauf: About two years ago Dr. W. F. Boggess and I had under observation a patient presenting symptoms practically identical with those mentioned by Dr. Gardner. I do not believe syphilis had much to do with the production of the symptoms in the case reported.

The patient to whom I have referred, had influenza while in the army. About the time he had apparently recovered, he was ordered to take what is known as a forced march of several miles. When he returned he was very much fatigued and developed symptoms similar to those described by Dr. Gardner.

I saw him first at the hospital with signs simulating hemiplegia. He was not hemiplegic, but was very spastic; the stiffness on one side was marked, he walked like a "string-halted horse;" there was some spasticity in his upper extremities. In addition he had twitchings of various muscles which I did not look upon as choreic movements; his fingers were flexed with the thumbs drawn inward; he had symptoms of tetany, and there were various interesting features about the case.

If you will read the reports of some of the cases of encephalitis lethargica of Bassoe, of Chicago, you will note that many of the cases reported by him have some signs of tetany. As I

have said, this man was very spastic on one side. Later he began to show signs on the other side, with twitchings of the fingers and with the thumbs drawn inward. He had marked bladder symptoms. It would require sometimes ten to fifteen minutes to start the flow of urine and then it would be spasmodic. The flow of urine would start, then a spasm of the neck of the bladder would occur, and it would be almost impossible for him to completely empty the viscus.

We gave him huge doses of magnesium sulphate and it had considerable effect on the vesical spasm. In four or five days he urinated rather freely. He also showed a marked pylorospasm. We gave him a barium meal which seemed to collect before the pylorus and remain there for several minutes, then relaxation occurred and in an hour and a quarter later barium could be found distending the colon.

If you will read the article on tetany in Allbutt's *System of Medicine*, you will find some cases absolutely identical with this. When Bassoe's reports were published many of them corresponded closely to the descriptions of tetany.

About that time I was particularly interested in tetany. Archambault and I had worked up the pathology rather carefully. The pathology of the two conditions is very similar. So much interested was I that I communicated with Archambault and asked him to compare the clinical and pathological reports. It is rather interesting that in the clinics of this country tetany is not a common disease, while in the clinics of Europe the disease is frequently seen.

Another interesting feature about the case I have mentioned was the marked trismus. One could see where the teeth had been ground. We did everything we could to overcome the spasms; we gave him large doses of magnesium sulphate and large doses of belladonna; he improved wonderfully. He finally became well enough to leave the hospital; however, I heard recently that he died three or four months ago.

My idea was that this was a typical case of encephalitis lethargica with definite manifestations of tetany.

I. A. Lederman: I saw this patient first during the time she was very sleepy and found it impossible to make any observation except to look at the fundus of the eye which was normal. At that time the question of diagnosis had been about settled but was not entirely clear.

I was inclined to think from the fact that she had normal eye grounds that it was a case of encephalitis lethargica. In all instances I have noted that the eye grounds have shown absolutely negative findings, there being but one exception in which marked engorgement of the veins was found.

Today my work was somewhat hampered by attacks of hysterical laughter occasioned by

the examination. For instance, as soon as I tried to look into her eyes with the ophthalmoscope she had a fit of laughter lasting for several minutes. When I tried to check the muscular action she had another fit, and so on. I was also impressed with the fact that she tired very quickly. Nevertheless, the examination which I made this afternoon was fairly satisfactory.

I found again that the girl had normal pupils and with eye grounds absolutely negative. She had no interference in mobility of any of the eye muscles. There was apparently no paralysis of any of the muscles. However, I went armed with the necessary paraphernalia to make a test of her muscle balance, which was done at a distance of about fifteen feet while she was sitting comfortably in bed, so I think the test was fairly reliable.

I found she had some weakness of the internal recti muscles to about three degrees; her left superior rectus is also weak to the extent of one degree; in other words, she has diplopia horizontal and vertical equivalent to three degrees exophoria and one degree hyperphoria as shown by the prism test. I found that she could not read ordinary print. Not having a test card with me I took a newspaper and stood across the room. She could read the name, *Courier-Journal*, and recognize some of the larger head lines, showing that her distance reading was apparently normal. I may say that she had no refraction error that could be detected by ophthalmoscopic examination except a low degree of hyperopia. I found it necessary to place before her a strong convex lens to permit her to read ordinary newspaper print. So she evidently has paralysis of the accommodating muscle.

From the ocular findings there is no question in my mind as to the diagnosis of encephalitis. Syphilis or cerebro-spinal meningitis sufficient to give rise to her symptoms would almost certainly produce some change in the fundus. At least the preponderance of evidence would be in favor of its being non-syphilitic, from the very fact that we have negative findings in the fundus with only slight involvement of three muscles supplied by the third nerve; furthermore, as Dr. Moren has said, the muscle imbalance improved without antisyphilitic treatment, and I presume will continue to improve and probably disappear entirely.

I do not believe syphilis would cause the muscular phenomena and the general clinical symptoms this patient has, and I think it is important in the diagnosis of encephalitis to take into account the fact that these muscular anomalies may occur early, and that we usually have negative findings in the fundus so far as the optic nerve is concerned.

THE FOURTH VENEREAL DISEASE.*

CHARLES W. JEFFERSON, Louisville.

Several decades ago, a "fourth venereal disease" was casually mentioned in medical literature, but for many years thereafter no serious attention was accorded the subject by the profession. The first comprehensive description of the disease is accredited to Bataille and Berdel (1891); it was christened the fourth venereal disease by Seherber and Muller (1904); it is now recognized as a distinct clinical and pathological entity.

"The fourth venereal disease, or specific ulcerative and gangrenous balanoposthitis, is an acute inflammatory disease of the glans penis and opposed surface of the prepuce, characterized clinically by ulcerations and at times gangrene, accompanied by a copious flow of strongly odorous pus, and caused by a spirochete in association with a fusiform bacillus. Constitutional symptoms are at times present."

Spirochetes and fusiform bacilli are never found in typical symbiotic association in other forms of balanoposthitis, although organisms of various types have been isolated from the excretions of such lesions. It may, therefore, be positively asserted that the fourth venereal disease owes its origin to the associated action of the two organisms mentioned.

Two forms of the disease have been clinically recognized, viz.: (a) the erosive or ulcerative type, and (b) the gangrenous type. However, this is an unnecessary and artificial division, since the latter merely represents an advanced rapidly progressive, usually untreated stage of the former.

It is interesting to note that morphologically the organisms responsible for the production of the fourth venereal disease are apparently identical with those found predominating in so-called Vincent's angina, otherwise known as gangrenous stomatitis, cancrum oris, "trench mouth," etc. Both the spirillum and the bacillus are anerobic in character, and the suggestion has been made that they may represent different morphologic types of the same organism. The vibrio differs in several essential respects from the *treponema parvum* found in syphilis.

Among the contributing or predisposing (direct and indirect) factors in the production of the disease, the following deserve especial mention: (a) preputial redundancy favoring uncleanness; (b) phimosis with exclusion of air favoring retention and decomp-

*Read before the Jefferson County Medical Society.

position of smegma; (c) the pernicious habit of moistening the labia or penis with saliva, and (d) the practice of coitus oris.

Even in typical cases the period of incubation is uncertain, but may be approximately stated as five days. The initial symptom is an itching or burning sensation involving the glans and inner preputial surface. This is soon followed by marked swelling, edema, persistent phimosis, the development of multiple painful ulcerated or eroded areas of the preputial surface and glans. These areas, when cleansed of necrotic covering are deep red in color with "punched out," irregular edges and surrounded by whitish zones. The ulcers exude a yellowish-white pus having a distinctive putrid odor. In most instances, the swelling, edema and pain are so marked that the prepuce cannot be retracted when the patient first applies for relief. Inguinal adenitis is a common complication. This is transient in character and subsides without suppuration after healing of the ulcerative lesions. The constitutional symptoms are of little consequence and need not be discussed. Without treatment gangrene may supervene and the entire penis may be thus destroyed.

The diagnosis is suggested by the appearance of the lesions, the rapidly progressive edema, the malodor of the excretions, and is confirmed by demonstration of the organisms in the exuded material after staining with gentian violet.

Case I: W. O. S., male, aged thirty-five years, came to me in January, 1920, with complete phimosis which had then persisted for six or eight days. The glans and prepuce were greatly swollen and edematous, there was a thin, exceedingly offensive yellowish-white discharge from the preputial meatus, and manipulation caused the patient to complain of considerable pain. He gave no antecedent venereal history, there were no complications, and he presented no constitutional symptoms. There was no pain on micturition.

Smears were made from the exuded pus and stained with gentian violet which showed the characteristic vibrios and fusiform bacilli. The patient denied coitus oris and the manner in which infection occurred could not be determined.

As retraction of the prepuce was impossible a dorsal incision was made which revealed numerous small ulcerated areas about the corona glandis and inner surface of the prepuce which did not resemble either chancreoid or syphilitic lesions; they were covered with grayish necrotic slough (plaques), the edges were irregular and presented a characteristic "punched out" appearance. After removal of the plaques the eroded areas were

bright red with white margins. Exudate obtained from the ulcers also showed the organisms upon staining.

The eroded areas were thoroughly cleansed with peroxide of hydrogen twice daily. No other treatment was applied. The patient was dismissed with the ulcers healed at the end of twenty days.

Case II. W. P., male, aged twenty, had Neisserian infection two years ago from which he made a satisfactory recovery. Venereal history otherwise negative. This patient also had complete phimosis when he first came to me, in September, 1920. There was a foul-smelling discharge with extensive swelling and edema of prepuce and glans. He complained of much pain during the examination. In addition to the other symptoms he had bilateral inguinal adenitis with some induration but the nodes were not painful. Pus showed spirilla and bacilli.

Treatment, as outlined in case 1, immediately instituted with prompt recovery. The adenitis subsided without suppuration.

Case III. C. V. R., male, aged twenty-five years, was first seen in December, 1920. He came to me with complete phimosis of two weeks' duration and other symptoms already detailed were present. The penile and preputial edema was much more extensive than in the two foregoing cases, and the patient complained of greater pain during examination.

Dorsal incision revealed characteristic necrotic ulcerated areas extending deeply into the tissues of both glans and prepuce, and gangrene seemed imminent. Examination of smears showed numerous vibrios and fusiform bacilli.

After thoroughly cleansing the ulcers with peroxide of hydrogen, absorbant cotton, saturated with wine of epicac ($\frac{1}{2}$ ounce), Fowler's solution (1 ounce) and glycerine (1 ounce) was applied to the eroded areas and allowed to remain for one hour. This treatment was employed twice daily for thirty days, at the end of which time the ulcers had completely healed and the patient was dismissed.

DISCUSSION

Edward R. Palmer: I was very much interested when I saw the title of Dr. Jefferson's case report on the program. It is curious how long this disease has remained unrecognized. I have been practicing medicine for twenty-five years and in that time have never made the diagnosis of erosive or gangrenous balanitis, and must confess that I believe it has been due to oversight on my part. Cases of that type must have applied to me for treatment during that time and were not recognized.

I took the trouble to look through various text books on genito-urinary diseases and in only two did I find mention of this subject. One of the latest (White and Martin) does not mention it; McDonagh goes into it carefully; but the best article I saw was in Cabot's *Modern Urology*, written by Corbus, of Chicago. He referred to a point which Dr. Jefferson mentioned casually and which I wish he would speak of more fully in his closing discussion, i. e., he stated that he obtained more ideas along this line in the old country; that this disease is caused by the symbiosis of a vibrio and a spirochaete, and these two organisms are exactly like those found in Vincent's angina. Corbus actually states in his article that he thinks it is always due to unnatural sexual practices and the organisms are identical with those which cause Vincent's angina.

Sherber believes that the vibrio has nothing to do with the pathological process. In fact, he made anaerobic cultures of the vibrio and inoculations in animals failed to produce any results. He had no success in attempting to make cultures of the spirochetes. It seems that necessarily anaerobic conditions must be brought about in order for these germs to develop, and according to Corbus the best treatment he had found was the application of peroxide of hydrogen or permanganate of potassium.

I hope Dr. Jefferson will speak in closing of the conditions as he saw them in Europe when he was there.

M. Flexner: I should like to ask Dr. Jefferson what may be expected from arsphenamin in the affection he has described. What effect has arsphenamin locally or intravenously?

Chas. W. Jefferson (closing): I think before I went to Europe that I had several of these cases, but like Dr. Palmer, failed to recognize them.

When I was in the Military Hospital in London, which is the Rochester Roe Venereal Hospital, I saw many of what I at first thought were severe cases of balano-posthitis, but they were so much worse than anything I had seen in this country that I began making some experiments. I did not know anything about the fourth venereal disease at that time.

In my first experiments the pus from the preputial lesions was stained with ordinary methylene blue, but I later changed to gentian violet and found this stain showed the spirochetes much better. Many cases of so-called trench mouth were sent to the hospital with the diagnosis of syphilis, and as a routine measure we examined the secretions obtained from underneath the plaques in the mouth of every one of these patients to determine whether the disease was syphilis or not. In no instance was the spirochaete of syphilis found, but we invariably noted the

presence of vibrios and fusiform bacilli in association with each other. When carefully studied differentiation is not difficult between the spirillum and the spirochaete pallidum; moreover, in all these cases the spirilla are associated with fusiform bacilli. The organisms appear to be identical with those responsible for the production of so-called Vincent's angina.

With further reference to the treatment: Dorsal incision was made in every case, and in a majority of instances I believe the patient would have gotten well without local applications, but we used permanganate of potassium and also peroxide of hydrogen. These organisms are distinctly anaerobic and by making a dorsal incision which exposes the diseased areas to the air, necessarily the growth of the bacteria ceases. I believe peroxide of hydrogen is more effective than permanganate of potassium. Another reason why dorsal incision is advisable is that the prepuce cannot be retracted on account of the edema and swelling. I have never seen this disease in the female sex, but understand cases have been reported in women.

The use of the mixture containing ipecac, Fowler's solution and glycerine was suggested by the fact that the British used this preparation in treating trench mouth. They removed or loosened the buccal plaques by the application of peroxide of hydrogen or permanganate of potassium, then followed this treatment by the mixture I have mentioned. This was applied thoroughly to the mouth and gums twice daily after cleansing as I have stated. That is how I happened to get the idea of using the ipecac-arsenic-glycerine mixture in cases of ulcerative balano-posthitis. It seemed to be effective but is perhaps no better than peroxide of hydrogen.

Dr. Flexner asked about the use of arsphenamin: I tried this locally in the form of powder, in solution with glycerine, and also in straight solution, and it had no effect whatever. I tried this agent also by intravenous injection and it had no effect. Arsphenamin was used in the treatment of trench mouth without any benefit.

The most appropriate treatment in both trench mouth and ulcerative balano-posthitis is to remove the plaques with peroxide of hydrogen or permanganate of potassium, and continue the application of these agents or use the mixture already described.

Aid in Diagnosis of Tumor of Urinary Bladder.—David R. Melen, Rochester, N. Y., (*Journal A. M. A.*, March 19, 1921) endorses the use of the roentgen ray in the diagnosis of tumors of the bladder. It is suggested that one should take an air cystogram first, then fill the bladder with sodium bromid solution, either 15 or 25 per cent, and take a second picture, and lastly take an immediate picture after emptying the bladder.

CARCINOMA OF PAPILLA OF VATER TREATED BY RADIUM.*

By IRVING ABELL, Louisville.

My reasons for reporting the following cases are: First, that in so far as I know, radium has not been used in similar manner; and second, that it demonstrates a method of applying radium to various types of internal cancer which is conceivably of distinct advantage as compared with the manner in which it has heretofore been employed.

Case history is briefly as follows:

R. E. K., male, white aged 34.

Family History: Father died at 74 of Bright's disease. Mother living, age 58, in good health. Four brothers living in good health. No brothers or sisters dead. Paternal aunt died of cancer of breast. Tuberculosis negative.

Previous Personal History: Measles mumps, chickenpox and whooping cough during childhood. Typhoid fever at seventeen, no serious illness since. No injuries. Denies venereal disease. Tonsils removed two weeks before coming under observation. Married; has four children living and one dead.

Present Personal History: First symptom noted February, 1920, five months prior to examination, at which time he suffered disturbance of digestion characterized by pain in the epigastrium, gas formation and nausea. These attacks have continued at regular intervals since that time. Fourteen days before coming under observation he had an attack of severe pain throughout the abdomen and under shoulders, was nauseated but did not vomit. Tonsils were removed at this time by physician in his home town. Four days later jaundice appeared and there was a repetition of colics referable to right upper abdomen; none of these produced vomiting and none of them required hypodermics for relief. During these five months patient noted that food induced pain and oftentimes precipitated acute colics. Patient lost 30 pounds in weight since onset of trouble, weighing at this time 135 pounds.

Examination: Heart negative; apex normal; no murmurs; rate 68; blood pressure 104-66; lungs negative; teeth negative; tonsils absent; thyroid negative; pupil and knee jerks active; skin jaundiced; abdomen showed palpable and visible enlargement under the right costal margin which presented the characteristics of a distended gall bladder. The liver was not perceptibly enlarged and no acute rigidity nor acute pain on pressure

over liver or gall bladder was noted. However, there was a dull pain on pressure over epigastrium and right hypochondrium. Temperature was normal, but family physician, Dr. Mudd, stated that following acute attacks fever of 101 to 102 had been present. Blood showed: hemoglobin of 85; red blood cells, 4,070,000; white cells, 14,600; polynuclear neutrophils, 68 per cent; small lymphocytes, 21 per cent; large lymphocytes, 9 per cent. Urine showed: specific gravity, 1016; amber in color; neutral reaction; no albumin or sugar; bile present; no casts; rare epithelial and white cell; occasional triple phosphate and many urates.

A provisional diagnosis of cholecystitis with probable secondary pancreatitis was made.

Operation July 10, 1920, showed the gall bladder, cystic duct and common bile duct tightly distended with bile and pancreas enlarged to about four times the normal size. The gall bladder was opened and over eight ounces of bile evacuated from bladder and ducts; no stones were found. Mucosa of gall bladder, as well as wall, showed changes characteristic of chronic cholecystitis. The bladder was drained with a large rubber tube which was brought through stab wound to the right of incision. Operative diagnosis—chronic and subacute cholecystitis, chronic and subacute pancreatitis. Convalescence was uneventful for the first ten days, when he had a chill with temperature rising to 102. During the ensuing five days chills were repeated and temperature reached 103, becoming normal on the 15th day after the operation. Patient went to his home on the 19th day after operation, the wound having healed by first intention with bile draining intermittently from stab wound.

Patient was next seen September 2, 1920, two months following drainage operation. History of recurring chills and fever during the five weeks he had been at home. Jaundice had never entirely disappeared and was invariably increased after each chill. Discharge of bile and mucus from drainage tract. Unable to take nourishment other than liquids. Stools light in color and offensive. Examination at this time showed the patient to be jaundiced and thinner, weight 105, having lost thirty pounds in the two months. Temperature 99, pulse 84; no abdominal tenderness except circumscribed area near upper angle of incision; no palpable mass; discharge from wound showed, at times, clear mucoid fluid; at others, bile. Blood showed: hemoglobin of 60; red blood cells, 3,430,000; leucocytes, 16,000; polynuclear neutrophils, 76 per cent; small lymphocytes, 17 per cent; large lymphocytes, 6 per cent. Urine showed: specific

*Read before the Jefferson County Medical Society.

gravity, 1010; acid reaction: no albumin; no sugar; no bile; no casts; occasional white blood cell. Fluid from drainage tract was strongly alkaline: contained albumin, pentose, bile, and digest fibrin which showed the fluid to be a mixture of bile and pancreatic secretion.

Bearing in mind the size of the pancreas and the fact that the gall bladder fistula continued to drain bile at the end of two months, it was evident that the obstruction must be at or near the terminal of the common duct. The abdomen was reopened on September 8, 1920, finding the gall bladder greatly thickened with but few intra-abdominal adhesions. Size of the pancreas had not greatly changed although it was smaller than at time of previous operation (July). The common duct was greatly distended and passed directly through the head of the thickened pancreas. The sensation upon palpation was that of inflammatory induration rather than the stony hardness of malignancy. The common duct was opened and exploration of same, together with the hepatic ducts, showed it to be negative. Probe introduced into common duct readily entered duodenum. Common duct was drained with T tube and the incision in duct was closed with superimposed layers of catgut. A cholecyst-duodenostomy was made by means of a Murphy button and linen sutures. Examination of papilla of Vater through incision in duodenal wall showed a well defined projection into lumen of duct of approximately one-fourth inch. To the naked eye this had the appearance of soft, granular tissue suggestive of carcinoma. Section removed for microscopical examination. Drainage tube brought out through original stab wound and incision closed. Convalescence from this operation was uneventful. The bile and pancreatic juice which came from drainage tube in common duct was collected and from 16 to 26 ounces introduced daily into stomach by means of a stomach pump. This latter had the effect of greatly improving the patient's digestion. Dr. Graves' report on specimen removed was adeno-carcinoma. The T tube was removed from common duct on the 12th day and no further external drainage of bile was noted. Jaundice rapidly disappeared, patient gained in weight and strength and went home on the 23d day following operation. Following this, improvement was marked and rapid until in November he had gained 41 pounds and was in excellent physical condition, the blood count being normal.

It was thought advisable to attempt radiation of the carcinoma. On November 24, 1920, the abdomen was reopened; pancreas

had markedly decreased in size, being but little, if any, larger than normal. Liver and remainder of abdomen showed no evidence of metastasis. Duodenum was exposed, mobilized and opened; tumor of papilla of Vater had increased in size, being approximately five-eighths by three-quarters of an inch. With the assistance of Dr. William J. Young, 25 mgm. of radium in two tubes anchored immediately against growth by passing needle containing No. 10 plain gut, superficially through mucous membrane above and below growth and tying these two over each end of the capsules or tubes containing radium. The capsules were attached to strands of heavy braided silk which were brought out of the mouth by means of a stomach tube passed in the usual manner and guided through pylorus to the incision in duodenum. The duodenum and abdomen were then closed. The radium was allowed to remain twelve hours, at the end of which time it was readily removed through the mouth by traction on the silk strands. Patient remained in the hospital 15 days convalescing, the wound healing by first intention and there being apparently no reaction from the radium.

Patient was examined on May 3, 1921. Present weight 150 pounds, general health good. Since January has noted attacks of pain in the epigastrium with, at times, a feeling of nausea. As soon as gas is expelled by belching relief ensues. There have been no attacks of severe pain since November. Stools are normal in color and form. On account of his digestive discomfort patient restricts his diet to cereals, potatoes, boiled meats, bacon and toast. This digestive disturbance I believe to be due to his chronic pancreatitis. X-ray examination of the stomach and duodenum on May 3d showed some slight lagging of the barium in the third portion of the duodenum; no retention. It is, of course, too early to know the ultimate result in so far as the carcinoma is concerned, but the method employed demonstrates that radium in almost any sized dose can be applied directly to some types of internal cancer which are not amenable to ordinary surgical removal.

DISCUSSION

Wm. J. Young: I am certainly delighted to hear that Dr. Abell's patient has shown such wonderful improvement. This is the first time I have ever attempted the use of radium in carcinoma of the papilla of Vater, and so far as I can determine it is the only time it has ever been done. Dr. Abell asked me if radium could be used in this instance, and I told him I was willing to take the chances with his assistance.

In this particular case we used 25 milligrams of radium which was left in situ for twelve hours, using three-fifths-inch gold filter, thus eliminating eighty per cent of the Beta rays. If I had another similar case I believe I would use .50 milligrams of radium and eliminate all the Beta rays by filtering.

So far as the feasibility of the procedure is concerned: The radium was easily introduced, as described by Dr. Abell, and it was surprising how readily it was removed by slight traction on the silk thread protruding through the mouth. Of course if we had anchored the radium against the papilla of Vater and had been unable to remove it, a subsequent emergency operation would have been required to rescue the radium and keep the patient from being burned.

We do not know whether the improvement shown by the patient will be permanent, but in treating this case we have made a start in the use of radium for relief of cancer of this type and it may be later we can handle such cases to better advantage.

The amount of reaction in this instance is just short of a second degree burn, with an inflamed area about the parts in contact. Just why the patient did not have nausea and other symptoms I do not know, but I am sure he had local reaction to the parts radiated.

Chas. G. Lucas: The case reported by Dr. Abell is of interest for two reasons: First, carcinoma of the papilla of Vater is exceedingly rare. Second, the method of treatment employed is something entirely new so far as my experience goes. I did not have an opportunity to see the patient but have had several conversations with Dr. Abell about it.

It is quite surprising that there was no reaction from the radium. We know that when 25 milligrams of radium are left in contact with the tissues for twelve hours, considerable reaction is to be expected.

I am glad to see that the results from treatment in this case have been so good. As Dr. Abell has frequent opportunity of seeing cases of cancer in this region, I hope we will hear further from him.

Neurasthenic Patient and Internist.—The neurasthenic syndrome William J. Mallory, Washington, D. C., (*Journal A. M. A.*, March 19, 1921) says is a type of reaction which may modify and partly obscures the symptoms of serious physical or psychic disease. Congenital and acquired physical inferiority should be considered important predisposing causes. The immediate cause of such a reaction may be psychic or physical, or both combined. In treatment, physical deficiency and organic disease should be recognized and relieved as far as possible in order to aid readjustment on the psychic level.

GUNSHOT WOUNDS OF THE ABDOMEN. REPORT OF CASES.*

By CHARLES FARMER, Louisville.

About twenty-five years ago there was a great deal of discussion regarding gunshot wounds of the abdomen. At a meeting of the Southern Surgical and Gynecological Association at Nashville in 1896, Dr. W. E. Parker, of New Orleans, read a paper on "Bullet Wounds of the Abdomen," and reported thirteen cases operated on with six recoveries and seven deaths. In the discussion of the paper, Dr. Howard Kelly presented a resolution which was carried that "it is the sense of the Southern Surgical and Gynecological Association that in gunshot wounds puncturing the abdominal cavity the proper routine procedure is to make an immediate exploratory incision." This was accepted by practically all surgeons at that time and has been the practice followed in the treatment of these wounds, at least in civil life. It has been quite otherwise in military surgery.

The mortality statistics presented by surgeons differ rather widely. Parker's mortality, as quoted from Col. LeGarde, U. S. A., was 47% in cases operated on in the first seven hours. Seigle's mortality was 51.6%, but in cases operated on in the first four hours was 15.2%. Richard Douglas' was 32.3% for all cases. Coley gives the mortality, when operation is performed in the first twelve hours, at 53.9%. After twelve hours, 77.3%.

In searching for cases that have been operated on at the City Hospital, where most of these patients are sent here, I found that in the past two and one-half years, during which period the wounds have been classified so that they can be referred to without difficulty, there have been thirteen patients operated on for gunshot wounds of the abdomen.

These patients were operated upon by eight surgeons and the results were five recoveries and eight deaths, a mortality of 61.5%. Of the abdominal organs wounded, the solid viscera give the lowest mortality. Wounds of the stomach and large intestine give a lower mortality than wounds of the small intestine. Wounds of the latter are considered the most fatal of all visceral wounds. Multi-visceral wounds, that is where one or more viscera are wounded; for instance a wound of the liver and stomach, or the stomach and small intestine, give a higher mortality than univisceral wounds.

Senn stated several years ago that trans-

*Read before the Louisville Medico-Chirurgical Society.

verse and oblique wounds of the abdomen produce more intestinal perforations than antero-posterior wounds. In the latter we rarely find more than four or five perforations, while in the former the perforations may be as many as eight, twelve or even twenty.

Regarding the anatomical lesions produced by these wounds, Quenu states that "The essential lesion is not the peritoneal penetration; and among the visceral lesions it is necessary to distinguish those which create danger from hemorrhage (the liver, the spleen, and the mesentery), and those which create danger from the effusion of their contents (the intestinal canal)."

A great deal of study has been devoted to wounds of the abdomen during the great war. It is the only war in which these wounds were treated systematically by celiotomy and this was only after the war had been in progress for a year and a half to two years. There was a great deal of discussion in the Paris surgical societies between the interventionists and the abstentionists. In May, 1916, the Paris Surgical Society went on record as favoring celiotomy in penetrating wounds of the abdomen.

The experience of former wars—the Spanish-American, Anglo-Boer, Russo-Japanese, and the Balkan wars, was that most operations for abdominal wounds ended disastrously, practically all the patients dying. The conditions were such that abdominal section could not be performed near the front and the facilities for transporting the wounded were so poor that these patients could not be operated on until too late. Parker, who had achieved such good results in civil practice, was in Cuba during the Spanish-American war and declined to operate on the abdominal cases under the existing conditions. The statistics of the results of expectant treatment were remarkable as many of the patients recovered.

At the beginning of the late war the French medical department issued an order that the abdominal cases were not to be subjected to celiotomy. The only operation done in the early part of the war was a small button hole incision above the pubis, the insertion of a drain, the placing of the patient in the Fowler position and proctoclysis. After a closer study of the abstention treatment it was found that the results were not so good as had been claimed. Some of the patients got well but it was found that in many only the abdominal wall had been injured and not the viscera. It is possible for a bullet to pass through the abdomen without wounding any of the abdominal organs. Tuffier estimates these cases at 11.27%. Some writers

estimate it as high as 15%. The French surgeons from a study on the topographical distribution of the lesions divided the abdomen into five regions.

1st: The umbilical and peri-umbilical regions, bounded externally by the colon and extending upward to the stomach. Wounds in this area involve the small intestine and transverse colon. These wounds do not heal under expectant treatment.

2nd: The hypogastric and pelvic region. Here we find the bladder, the small intestine, sigmoid flexure of the colon and the rectum. Patients wounded in this area do not recover without operation.

3d: Flanks. Here is found the ascending and descending colon. Wounds in this area have a chance to heal spontaneously if they are antero-posterior and are caused by a bullet or small shell fragment.

4th: The upper region. In this area is found the liver, stomach and spleen. The chances for spontaneous healing diminishes from right to left. Bullet wounds of the liver heal spontaneously fairly frequently. In the stomach occasionally, if wounded when empty, or if the arterial circle is not involved. Wounds of the spleen produce severe hemorrhage, particularly in bursting wounds. In this region is also found the left colic angle and some coils of the small intestine.

5th: Higher. Abdomino-thoracic wounds are encountered. These, as a rule, are either benign or very serious.

It is hardly necessary to dwell on symptoms of penetrating gunshot wounds of the abdomen. The symptoms of shock are not reliable, for it may be present in an injury to the abdominal wall and absent in a very severe wound of the viscera. If we wait for symptoms we may lose the opportunity of saving the patient's life.

It has been my practice to operate on all cases at the earliest moment, even if there is only a suspicion of abdominal penetration. If we find no lesion of the viscera the patient should recover, and if we find lesions we will often save patients where if we waited until symptoms developed we would be too late.

I think it is well before operating to get an idea of the organs that have probably been injured. If there is a wound of exit we can do this. If we can get the direction from which the patient was shot it is also of service. Where there is no wound of exit, x-ray examination by locating the missile, will enable us to know approximately what organs have been injured, and to place our incision at the most advantageous point.

I have little to say regarding operation.

The incision should be so placed as to give the best access to the wounded viscera. It can be extended transversely if necessary. There is no surgical condition where time is a more important factor. If there is a wound of the solid viscera, by operating early, we lessen the chances of death from hemorrhage, and in case of the hollow viscera we prevent the escape of their contents into the abdominal cavity. After twelve hours the operative mortality mounts very rapidly. The operation should be done as expeditiously as is consistent with thorough surgery. The patient should not be eviscerated as this adds greatly to the shock. The intestines as they are examined should be returned to the abdomen. If kept out for any reason they should be surrounded by hot gauze packs.

Many of these patients will be beyond surgical help no matter how early we get them after injury.

REPORT OF CASES.

(1) F. F., colored, 35 years of age. Operated on at the City Hospital in 1910. Pistol wound of the right hypochondrium. Bullet passed entirely through the body from before backward. Calibre .32. Wound of exit on a level with the wound of entrance. Abdomen opened through right rectus muscle. Considerable hemorrhage in cavity and still some bleeding from tunnel wound of liver. This was controlled by gauze packing. The end of the gauze was brought out through the abdominal incision. Patient recovered without complications. Gauze removed about the fourth day. No evidence of any wound of the thorax. Patient operated on two hours after injury.

(2) M. M., white, female, 12 years of age. Shot in abdomen with .22 calibre rifle. Bullet entered abdomen two inches above and two and a half inches to the left of the umbilicus. Patient wounded twelve miles from the city and brought to Norton Infirmary in an automobile. Operation six hours after injury. Abdominal incision in left rectus muscle with entrance wound at the center of incision. Five perforations were found in the small intestine and sutured. Cigaret drain was placed in cavity; removed in two days. Patient made an uneventful recovery.

(3) December 21, 1912. Was called to see Mrs. G., twenty miles in the country. She had received two bullet wounds from a .38 calibre Colt's revolver. This is the type of revolver formerly used in the U. S. army. Patient was shot from behind, one bullet entering the neck one inch below the lobe of left ear, passing under the ramus of the jaw, under the tongue, knocking off a small piece of the alveolar process of the lower jaw and the

two lower right incisor teeth. The other bullet entered the back three inches to the left of the spinal column and four and a half inches above the crest of the ilium and passed entirely through the abdomen, emerging in front two inches above and two inches to the left of the umbilicus. The wound of exit was about one inch lower than the wound of entrance. Patient had bled considerably from the wound of entrance posteriorly and pulse was feeble. There was considerable shock. Abdomen opened at the outer portion of left rectus. No injury to the intestine could be found. The bullet had slightly abraded the inner surface of the descending colon; abdomen closed without drainage. Recovery. Operation six hours after injury.

(4) Miss H., 19 years of age, brought to City Hospital. Bullet entered left hypochondrium from the front: .38 calibre Colt's revolver used. Patient almost moribund from hemorrhage. Abdomen opened at outer portion of left rectus, filled with blood. Was unable to determine the source of hemorrhage and patient died shortly after leaving operating table. Operated on two hours after injury.

(5) Latter part of August, 1918. French soldier, 40 years of age: struck in abdomen by a fragment of shell as large as a grain of corn. Wound of entrance was situated two inches above the umbilicus, one inch to the left of median line. The missile crossed over to the right side, penetrating the omentum just beyond the transverse colon and had penetrated the cecum but was lodged in the cecal wall. Fragment removed and wound of cecum sutured. Abdomen closed without drainage. The soldier also had a small fragment of shell in the left lung which required no treatment. I was at that time working with the French and left the hospital eight days after the patient had been operated upon. He was in excellent condition and I think we are safe in putting him down as a recovery. Operation eight hours after injury.

(6) H. B., 7 years of age, male. Brought to City Hospital February 1, 1921. Had received pistol wound in abdomen. A piece of omentum as large as my thumb was protruding from the wound in the abdominal wall. Bullet entered an inch and a half above the umbilicus and an equal distance to the left of the median line. A vertical incision was made through the wound entrance. One perforation of the small intestine was found. There was also an abrasion of the serous coat of the transverse colon. The wound in the small intestine was closed and the abrasion of the colon covered by placing two or three

Lembert sutures. Abdomen closed without drainage. Except for a bronchitis which was rather troublesome for two or three days, the recovery was uneventful and the patient was discharged from the hospital on the 13th day. Operation two hours after injury. Bullet found loose in abdominal cavity.

(7) E. M., 43 years of age, female, colored, admitted to hospital 10:10 p. m., March 29, 1921. Patient had been shot in the abdomen. Bullet entered one inch below ensiform appendix and about two inches to the left of the median line. No wound of exit. Eight days later bullet was removed from back, two and a half inches above crest of ilium and two inches to the left of median line; slight suppuration about it.

This patient had had supper at 5 p. m., which consisted of cabbage, Irish and sweet potatoes, corn bread and buttermilk. Some time after supper she ate two apples.

Patient was wounded at 9 p. m., and brought to hospital. Shortly after her arrival she vomited the cabbage and apples. There was a little blood mixed with this. Pulse 92, temperature 96° F. Patient was operated on about midnight; abdomen opened in median line from the ensiform appendix to umbilicus. Abdomen filled with blood; wound on anterior surface of stomach found. This was very high and was sutured with difficulty by pulling stomach downward.

Meso-colon opened and search made for a wound on the posterior wall but it was so high I could not get at it. No bleeding or extravasation in lesser peritoneal cavity. Wound in meso-colon closed. The region of hemorrhage was retro-peritoneal and was entering the abdomen through the bullet wound. Hemorrhage had ceased somewhat and the abdomen was closed without drainage.

This patient's pulse could not be counted for two or three hours after returning to bed. She was conscious four hours after operation and at 6:30 a. m., pulse was 88 and temperature 98.4° F.

Except for a slight infection in the lower angle of the wound patient made a good recovery. Operated on three hours after injury.

Since operating on the last case I have read the following and found some comfort in doing so. The article is by Von Frisch, Archives of Clinical Surgery, 73-No. 3-1904.

"Case in which the hole made by the bullet in the stomach could not be found, though it has unmistakably passed entirely through it. The patient recovered normally. Research in animals has also shown that the hole made as the bullet passes out of the stomach is usually a small slit, discovered with difficulty. The entering hole is much larger

and the stomach contents, if they escape at all, do so through this first opening. When the entering hole is not more than 7 or 8 mm., in diameter it is wisest to abandon the search for the other opening if it does not readily present. The abdomen can be sutured with confidence, as the mucosa plugs the second opening."

DISCUSSION

J. G. Sherrill: I wish to congratulate Dr. Farmer on the outcome in his cases. I have not had any such good results. I think everybody agrees that the best treatment in this class of injuries is prompt abdominal section. I learned from my hospital experience as interne that it was bad policy to open the abdomen in the middle line in some cases of wounds in the flanks. I saw a man die whom I believe could have been saved had we explored the original wound first. The man had a gunshot wound of the descending colon. The case occurred in the service of the late Dr. T. Hunt Stucky and he asked me to do the operative work. An incision was made in the middle line of the abdomen and we did not find any wound of the intestine. The patient went along for several days and then developed peritonitis from injury to the colon which had occurred behind the peritoneal sac. This man might have been saved if the original wound had been explored and drainage instituted.

During my experience in the army I saw a gunshot wound of the colon. I was positive that the colon was injured, but it seemed to me owing to the large size of the opening that it would be safer for the patient not to operate. It seemed certain that the wound was extraperitoneal. For a number of days this man was under observation and did nicely. He had no fever at any time and probably made a satisfactory recovery.

As stated by Dr. Farmer in his paper, wounds in the flank are less dangerous than wounds in the central portion of the abdomen. It is also true that when the bullet penetrates from side to side the wound is more dangerous than when it goes directly through from front to back.

It has seemed to me from observation that the greatest amount of shock always occurred where there was hemorrhage, and I have come to believe more and more that in the majority of cases shock is due to hemorrhage. Of course we may have shock from other causes, but in the vast majority of instances, certainly in surgical cases, shock is measured by the amount of blood lost. In brain injuries shock is very much greater, because the loss of a large amount of blood from the brain is followed more rapidly by syncope and shock than in any other part of the body. Prolonged anesthesia and prolonged manipulation of the intestine during operative steps produces a certain amount of shock.

I think Dr. Farmer is correct in his contention that speed is of the greatest importance in operations for gunshot wounds of the abdomen. I think it just and proper to give credit to Dr. John Young Brown, a native of this state, for the development of this subject. Several years ago he read a paper on gunshot wounds of the abdomen before the Southern Medical Association which is still a classic. His contention was that the incision be made free enough to permit access to the damaged tissue, that you could then examine the intestines without evisceration, and the results would be much improved. I believe his mortality statistics confirmed his contention.

Dr. Farmer's record is as good as any I know and he ought to be proud of the work he has done.

Guy P. Grigsby: I do not want to bore you with war surgery and war talk, but it may be interesting to state that we saw many cases of gunshot wounds of the abdomen. During the first week or two we did not have a surgical team or operating room facilities to take care of many cases of abdominal injury and in consequence many of the patients were not subjected to operation. Much to our surprise many of them recovered. Later when our surgical team was better organized and our facilities were increased, more operations were performed in this class of cases; but even then the results in the cases treated conservatively compared very favorably with the cases operated upon. However, in the class of cases that we received there were comparatively few gunshot wounds. Practically all of them were due to shell fragments and the amount of injury to the viscera was in no way comparable to the wound entrance or to the size of the fragment. It was very remarkable at times to see the wound entrance not much larger than the end of a finger, and on opening the abdomen to find that probably for a space of four or five inches the small intestine would be absolutely destroyed. It seemed that some way, I presume due to the irregular surface of the missile, that these wounds were much more extensive than the clean cut wounds made by bullets.

I recall a man particularly who was passing blood by the rectum and bladder and who evidently had an immense hematoma underneath. The iliac vessels were involved in what I took to be aneurism. He had been wounded twenty hours before. We put him in the ward and gave him plenty of morphine thinking he would surely die. When I saw him the next day he had markedly improved and finally made a perfect recovery. We kept him there two months as orderly in the hospital. His case was only one of many in which the condition seemed desperate, localized peritonitis being present at the time we received them.

In my experience at the Louisville City Hospital I have operated upon two or three patients for gunshot wounds of the abdomen with one hundred per cent mortality. I believe all three of the patients I have operated upon died. One case of unusual interest was a woman who was standing on the steps slightly above her assailant and was shot with a revolver, the bullet entering above the umbilicus. She was in severe shock at the time. We opened her abdomen and found quite a large wound of the stomach. Her condition was so alarming that we thought she would die on the operating table. After being warned by the anesthetist that the patient was in extreme danger of dissolution, I simply closed the abdomen with a drain, doing nothing except to repair the wound in the stomach. She lived until the next morning. We found fourteen wounds of the small intestine at autopsy.

Louis Frank: I want to compliment the essayist on his most excellent record and his very low mortality. I think the secret of success in gunshot wounds of the abdomen depends almost entirely upon the time the patient comes to operation. Deferred operation practically means death in the vast majority of them. There may be a few of them in which recovery may take place after drainage in which wounds may not be extensive.

There can be no comparison made between the results in military and civil practice for several reasons. There can be no comparison made between wounds which are due to shell fragments which are penetrating and those which are due to revolver bullets so far as the amount of injury is concerned. We are apt to be misled unless these features are considered. I dare say the French authorities were right in their contention that many of these wounds should not be explored. For instance, in the Boer war we know the majority of the soldiers with abdominal wounds who were left alone made good recoveries. Another feature which must be taken into consideration is the condition of the intestinal tract at the time the injury is received. All of these things must be considered.

In civil practice these things do not enter because here we have entirely different conditions, the wounds are inflicted under different circumstances, as a rule by an entirely different character of weapon, usually pistol bullets. I have seen a few gunshot wounds of the abdomen and all of them have been the result of pistol bullets. I have had the same experience Dr. Farmer related, the bullet having gone entirely through the abdomen without inflicting any injury upon the viscera.

Dr. Sherrill called attention to a very important point, that is apparently there may be no injury to the small intestine and yet the patient may die from extensive injury to the large

intestine posteriorly and extraaperitoneally. This possibility must always be borne in mind and search should be made for such wounds.

As to rapidity of the work: I think this is best done by making a large incision as recommended by Dr. John Young Brown and mentioned by Dr. Sherrill. The stomach and other portions of the gastroenteric tract should be explored as well as the solid viscera. Personally, I have not seen a death result from an extensive wound of the intestine where the patient was subjected to operation within less than an hour after the injury. I recall one case where there were five or six perforations involving the stomach, the small intestine, the large intestine, the gall bladder and the liver, and the patient recovered. The operation was performed four hours after the injury. I think all of these cases should be subjected to operation immediately. If considerable time has elapsed since the injury, and there is any question about the lesser cavity being involved, then I think drainage should be instituted; otherwise, if operation is performed early, the abdomen should be closed without drainage. We should not overlook injuries to the solid viscera as these are important.

Dr. Farmer's results compare favorably with any that I have seen.

L. W. Frank: There is very little left to be said. Like Dr. Grigsby, I do not like to discuss war experiences, but I recall twelve or fifteen cases in which the patients came to us late and all of them died. In these cases there were perforations of the hollow viscera by shell fragments. In several other cases where the bullets simply penetrated the abdominal cavity recovery followed operation.

In regard to the causes and the results obtained where no operations were performed: I recall having examined two men particularly. One case in the hospital eight days and the other two days after through-and-through wounds in the umbilical region. Both these patients recovered. One of them was injured when the troops were advancing very rapidly and he had been practically without food for three days and subsequent to his injury had laid in a shell hole for three days and could get nothing to eat. I think this accounted for the fact that he recovered. He had nothing in the intestinal tract at the time he was wounded; he was on a starvation diet of necessity. The other case was similar in character, he was shot through-and-through and had received nothing to eat for forty-eight hours.

As the last speaker has said, we cannot compare results obtained in cases of this character in civil and those seen in military practice, especially during the late war, where a large majority of them were shell wounds and where the type of infection was different than that or-

dinarily seen in civil practice, most of them being due to the hemolytic streptococcus associated with the gas bacillus.

A year and a half ago I operated upon a child in the Louisville City Hospital where there was a wound of the stomach, the liver, the large intestine, and three perforations of the small intestine. The patient was admitted about two hours after the injury. The roentgen-ray showed two fragments of the bullet in the body which could not be found at the operation. All the perforations were closed and the patient made a perfect recovery. There was a large wound of the liver into which a thumb could easily be introduced. This was packed and drained, the drain was removed the fourth day when healing was complete.

I agree with the other speakers in that recovery of the patient suffering with intra-abdominal gunshot injuries depends to a certain extent on the character of the weapon with which the injury is inflicted, the distance at which the patient is standing at the time, the speed of the bullet, and also whether or not any of the large blood vessels have been wounded; but most of all upon the rapidity and thoroughness of the operation.

Chas. Farmer (closing): I wish to thank the gentlemen for their liberal discussion. In war surgery we must remember if the patient is hit by a rifle or machine gun bullet under two hundred yards there is usually an explosive effect from the bullet in the abdominal cavity and death occurs promptly. In the early part of the war most of the abdominal injuries were caused by bullets, and I think this is the only way in which high explosive shells were used. Towards the end of the war practically all wounds were produced by shell fragments. I recall having operated upon one patient who was injured by shrapnel. Shell fragment injuries require operation much more urgently than bullet wounds, because the tumbling motion does a great deal more damage than an ordinary bullet and the fragment carries pieces of clothing into the body. Nearly every shell wound I saw was infected.

Swiss Bathing Places.—A booklet sent out by the official information bureau of Switzerland, 241 Fifth avenue, New York. Any physician interested in the subject may write to the official of the bureau for a gratuitous copy of the work. The rich treasury of health springs to be found in Switzerland is known all over the world. The soil of the mountains as well as of the plains of this country provides mineral waters of very different compositions and importance, the value of which for medical purposes is manifold. The pamphlet draws attention to these health springs and their effects.

APPENDICITIS.*

By WM. EDGAR FALLIS, Louisville.

I have chosen this subject for your consideration this evening because it interests all classes of the community more than any other acute disease. It is serious and alarming—it appears in many forms. Our present knowledge of the subject has been developed during our own generation and it calls for heroic treatment.

It is an inflammatory disease of the vermiform appendix.

The history of appendicitis is comparatively recent, although for several centuries there was knowledge of pain and inflammation in the right lower abdomen, which was often fatal.

It was not until 1827 that any definite advance was made. At that time the noted French surgeon, Dr. L. Méliér, reported cases of undoubted appendicitis (which were verified by autopsy) naming among its symptoms fixed pain in the right iliac fossa and colic. In spite of these facts the profession was not persuaded that most of the right-sided iliac abscesses were due to appendiceal perforations until Dr. Reginald Fitz, of Boston, in 1886, explained the nature of this process and introduced the term "Appendicitis." Since then much has been written upon the subject by such noted surgeons as Kraft, McBurney, Gross, Park, Richardson, Buck, Deaver, Murphy and Ochsner, and the wonderful advance in the methods of dealing with this condition together with the marvelous reduction in the mortality rate speaks volumes for the diligent study and untiring efforts of these stout-hearted pioneer surgeons.

The anatomy is very important. The appendix may be considered as a long, narrow, musculo-membranous-diverticulum which springs from the posterior and inferior part of the caecum and which lies in the right iliac fossa in its typical position. The free end may hang over the brim of the pelvis or be in contact with the liver. About one-third of all appendices are in relation with the posterior surface of the caecum.

Its structure is particularly liable to infection because of the large amount of lymphoid tissue in its make-up. Its dependent position causes it to be filled with bacteria—it has a poor blood supply—and is easily blocked by kinking or swelling of its mucous membrane.

It is a vestigial structure and has a low resisting power, and being functionless (like a loafer in a city) is a menace. The loafer

is apt to become a criminal and the appendix is likely to become inflamed and kill. This structure is very similar to the structure of the colon, except that the muscular tissue is trivial in amount and poorly developed. The sub-mucous and sub-peritoneal tissues are in very close proximity to each other in consequence of the numerous gaps in the muscle.

The blood supply is through a single vessel, a branch of the superior mesenteric artery.

All these facts, coupled with the other peculiarities of the structure, causes gangrene to occur from rather trivial causes.

In the etiology of this disease age holds an important place—it is comparatively rare in children (although cases are reported in infants as young as 60 days)—it reaches its highest percentage between the 20th and 40th years in life.

It is about four times as common among males as among females.

It is, strictly speaking, a bacterial disease, the colon bacilli taking first rank in order of infections. Any condition which would reduce the general resistance of the individual would to a certain extent predispose to an attack.

This fact, together with the age of from 20 to 40 years, when most individuals are straining every nerve and muscle to establish themselves; when overwork, exhaustion and endurance of all sorts of weather are a part of the daily routine, makes them a prey to the ravages of this disease.

Dr. J. S. Evans reports 236 cases of acute appendicitis among students of the University of Wisconsin in six years. In 183 or 86% of these, there was a definite history of a primary infection of the upper respiratory tract, such as pharyngitis, tonsillitis and bronchitis. The primary infection preceded the acute appendiceal attack on an average of 16 days.

The pathology of appendicitis is difficult to describe in a paper of this character because of the many different forms in which we meet the disease. We all know that the pathological findings in each of these many forms differ greatly and we are constantly meeting with conditions which do not seem to correspond with the symptoms presented by the patient. The terms, appendiceal colic, catarrh of the appendix, acute appendicitis, gangrenous appendicitis and chronic appendicitis are all expressions of one disease—the main difference of which is the virulence of the infecting organism or the resistance of that particular patient.

When an inflammation occurs, the mucous membrane becomes swollen and the lumen of

the appendix may become obstructed. When this occurs, the canal is filled with a mucopurulent fluid, ulceration takes place which may involve only the mucous membrane or the process may continue until perforation follows.

The presence of a concretion is always dangerous. It is a mass of virulent bacteria and may lead to perforation or gangrene.

Most authorities consider the so-called appendiceal colic or the effort of the appendix to empty itself, as an inflammation without peritoneal involvement.

A foreign body may produce instant perforation or the obstruction produced by the foreign body may interfere with the emptying of the secretion; then distention is rapid; circulatory disturbances are produced by the tension; bacteria multiply; and gangrene or perforation rapidly follows.

If the resistance of the patient is sufficient or the type of the bacteria is not too virulent, nature will cause the small intestines and the omentum to surround the infected organ and, if rupture does occur, we will have a localized abscess formation. This is often seen in cases where the appendix is retro-cecal or where it lies to the outer side.

When the streptococcus is the organism producing the infection, a general peritoneal involvement usually follows. It has been proven that perforation is not necessary to produce peritonitis, when this is the infecting organism as this germ has the power to migrate through the congested walls of an obstructed appendix.

I am purposely omitting a lengthy discussion of the numerous forms of the disease. Appendicitis is always one disease (an inflammation of the appendix). It is useless to divide this subject into a great number of pathological groups since the treatment should always be the same.

The symptoms of acute appendicitis are usually of sudden onset, but oftentimes there are some premonitory signs, such as constipation, flatulency, anorexia, or a general gastrointestinal uneasiness. The first definite sign is severe colicky abdominal pain, usually general at first (often agonizing and producing shock and collapse) seldom localizing in the right side until several hours following its onset. The tongue is coated and usually dry, great thirst is often present which, in an effort to quench, converts the attending reflex nausea into active vomiting, the facial expression is anxious and the features pinched. The patient's position is rather suggestive, usually recumbent with right thigh flexed upon the abdomen. Tenderness over the right iliac fossa usually occurs in from 12 to 36 hours follow-

ing the onset of the disease and is to interpreted as an inflammatory irritation of the peritoneum. There is always some elevation of temperature though it may be only slight and of brief duration.

General abdominal rigidity is the rule, eventually reducing some in intensity and limiting itself to the right rectus muscle unless a general peritonitis supervenes.

The pulse rate is usually in keeping with the temperature. Leucocytosis is present; and after the disease has lasted for several days, a mass may be felt in the right lower quadrant of the abdomen. A moderate abdominal distention is a common occurrence in these cases.

A positive prognosis in any given case of appendicitis is an absolute impossibility. It is all well enough to have a mental picture of what one thinks is going on inside the abdomen, but with all the means that are at hand to aid us in arriving at a definite conclusion in so far as the amount of damage to the appendix and how much repair we can expect is still a scientific prediction of probabilities.

There are a good many danger signs, so to speak, which impress upon us the need for radical conclusion:

1. In appendicitis purgation means perforation.

2. As long as the pain is present (some one has said) the inflammatory process is still within the appendix, that is, in the early cases.

3. The cessation of pain usually means the emptying of the distended appendix—either into the colon or the general cavity.

4. Persistent vomiting should be considered as pointing to peritonitis, pus formation, or obstruction, unless it be the result of the administration of an opiate.

5. Very high leucocytosis is indicative of either a grave infective or a brave fight, while an extremely low count may indicate either very feeble resistance or an infecting organism of low virulence.

6. Extreme tenderness and marked rigidity, I believe, are symptoms of marked gravity and should cause us to give much more guarded prognosis than any other signs.

The diagnosis of appendicitis is not invariably easy, as many light-hearted men seem to think, and is occasionally impossible without an exploratory operation.

As the appendix is the most common seat of all the acute abdominal diseases, I have made it a practice to consider the appendix first in all abdominal conditions.

The late Dr. John B. Murphy reported 2,000 tabulated cases of appendicitis in which pain

was the first symptom and he gave to the world his five point diagnostic rule:

1. Pain.
2. Nausea and vomiting.
3. Tenderness.
4. Temperature.
5. Leucocytosis.

His faith was so strong in this rule that he repeatedly stated that whenever there was any variation from this order of occurrence he stoutly questioned the correctness of the diagnosis.

The lesions that are most commonly mistaken for appendicitis are renal colic, gall bladder disease, tuberculosis of the tubes in girls, perforated gastric and duodenal ulcer, acute intestinal obstruction, tubercular spine, mesenteric thrombosis and gastric crises. All these conditions produce additional signs which will enable us to make a clear differentiation if we use the means we have at hand.

In renal colic we have the pain radiating into the scrotum; nausea and vomiting are usually present before the pain; there is seldom any elevation of temperature. These facts, in connection with the positive findings in the urine of blood and crystals, should be sufficient to make a differentiation.

In gall bladder disease we find the pain radiating to the right shoulder; tenderness in the upper right abdomen, and usually we can elicit a history of dyspepsia.

In typhoid fever we have the prodromal symptoms; the positive Widal reaction and the characteristic temperature curve.

In intestinal obstruction the vomiting is persistent; there is marked abdominal distention; the pain and tenderness are not localized in the right iliac fossa.

In perforated ulcers of the duodenum or stomach there is the usual accompanying gastro-intestinal disturbance; the pain is extreme; shock is very pronounced; and the abdominal rigidity board-like.

In gastric crises, there is absence of temperature elevation; tenderness and abdominal rigidity.

In tubercular spine careful examination will reveal its limited movement; a spinal deformity and a possible afternoon fever.

The treatment of appendicitis is operative and the sooner the operative measures are instituted the lower the mortality rate will be.

I believe the operative measures should be instituted as soon as the diagnosis is made unless there is some special contraindication. This view is conceded by everybody. No physician, no matter how large his experience may be, can judge from the early symptoms, i. e., in the first 36 hours, whether the case

is going to terminate favorably or unfavorably from a pathological standpoint.

So *now* is the acceptable time while the infection is still confined within the appendix. These facts have been thoroughly established in many clinics and nobody has a right to hold an opinion about appendicitis which is at variance with established practice.

We must admit that we cannot tell what the outcome is going to be in any individual case of appendicitis and we know that the appendix can be removed with a great deal less danger to the patient and much more comfort to ourselves during the early stage.

It is an entirely different proposition when you undertake to remove an "acute appendix" after the third day, and it will tax all your surgical technique and general surgical principles to obtain a satisfactory result.

When operating on all acute cases, it has been our practice to use the methods of Battle in opening the abdomen which, as you know, is the method of reflecting the rectus muscle to the median side and opening the peritoneum behind. This seems to me to afford all the room one needs and I think leaves a stronger abdominal wall following the operation and thereby lessens the likelihood of a post-operative hernia.

When we feel sure that there is pus present, I believe that the method of dividing the rectus muscle is the better means of opening the abdomen.

The first consideration is always the outcome of your patient and I try to be guided in all my operative procedures by what we find when the abdomen is opened. If the operation is early, a simple appendectomy is done. If an abscess is encountered, I am usually satisfied to open it, establish drainage and make a hasty exit, unless the appendix can be removed without any additional extension of infection or too much handling of the intestines, thereby opening new raw surfaces for absorption of the septic material.

When the general peritoneum is involved, it is imperative to "drain and get out." In all cases of this character it is well to consider doing your work under local anesthesia, thereby lessening the amount of strain on the already extremely burdened heart muscle. When this is not possible then all preparations should be made before the anesthetic is started so that the patient will be under the influence of the anesthetic the shortest possible length of time.

I am a staunch advocate of rapid work. I do not mean that one must sacrifice technique for time; but when one has mastered both, he has gained a great deal for his patient. Most any patient will stand a short anesthetic,

but when one must be subjected to both operation and anesthesia over 60 minutes I believe that the vital forces are greatly disturbed and very much more time is required to regain the fighting forces.

Septic intoxication is the primary and most frequent cause of death in peritonitis. The prevention of absorption is therefore of greatest importance and the value of Fowler position in conjunction with the Murphy proctoclysis cannot be too strongly emphasized. By this means the septic material is allowed to gravitate into the pelvis where the lymphatic absorption is less marked and drainage is more perfectly established. The saline is rapidly absorbed by the mucous membrane of the rectum, thereby diluting the toxins, increasing peritoneal exudate, kidney elimination and cardiac action.

Dr. J. B. Deaver reports the end-results of operations in 1,700 cases of appendicitis. This series includes all the cases operated on and his mortality rate is 3.7%.

The more frequent sequelae requiring subsequent operations were:

1. Fecal fistulae with a mortality rate of 7.6%.
2. Secondary abscesses with a mortality rate of 21.2%.
3. Obstruction with a mortality rate of 40%.

His closing conclusions are that these (sequelae) are directly the result of late operations and insufficient drainage and it seems to me that these statistics, coming from a master surgeon, should be our strongest argument for the early operation in appendicitis.

DISCUSSION

J. Hunter Peak: Appendicitis is a subject about which most of us feel there is little left to be said. We have encountered the disease so frequently and have seen so much of it that we feel like everybody ought to know all about it. However, I want to emphasize what the essayist has said, that cases of appendicitis sometimes tax the ingenuity of the surgeon to the utmost, I do not care who he is.

I recall one case where an appendiceal abscess had developed and ruptured although the patient never felt ill enough to go to bed. The patient was a boy seventeen years old who had been robust and healthy all his life. The first symptom that was called to the attention of the family, outside of slight pain in his right side, was that he developed some trouble with his bladder and passed a considerable amount of pus with the urine. The boy was sent to a genito-urinary

specialist, a cystoscope was used and the diagnosis made of ulceration or perforation of the bladder and possibly an abscess behind the viscus as a result of the ulceration. Another specialist made the diagnosis of cancer of the bladder. The patient went along in that condition for several months.

When he came to me with this history it seemed almost certain there was some trouble about the bladder, and I thought drainage was indicated. A superpubic cystotomy was performed and an opening was found in the right side of the bladder through which my finger could easily be introduced. There was very little urine in the bladder, but by pressing on the abdominal wall above urine could be seen entering the bladder through the opening mentioned. I believed that the abscess or whatever it was above and to the right of the bladder ought to be drained allowing the bladder wound to close as quickly as possible, and that was done. When an incision was made in the region of the appendix the remains of an old abscess were found where the appendix had ruptured, the abscess having drained itself through the bladder. The boy made an excellent recovery.

I recall another instance where a young business man of Louisville developed some bladder trouble and a diagnosis of cystitis was made. He had some pain in the right side of the abdomen but not very much. Believing that it was a case of appendicitis I opened the abdomen and found the appendix ruptured and adherent all the way across the bladder. In dissecting the appendix away from the bladder I very much feared the latter viscus would be opened, but fortunately it was not. The appendix was gangrenous and the abdominal incision was closed with drainage. The patient recovered.

I have seen many cases of appendicitis where the symptoms were indefinite and atypical. The symptoms are not always classical, and this should not be forgotten in making the diagnosis. This is particularly true where the appendix is retro-cecal. I have seen two such cases recently, both patients coming from the country the same day. One of them was operated upon at noon, the other at nine o'clock that night. In both instances the appendix was retro-cecal. Both these men came on the train and were able to walk to the conveyance which took them to the hospital. Neither of them had any characteristic symptoms. In both the appendix was gangrenous and abscess had already formed. Had I known in advance exactly what the condition was in each case, an opening could have been made above the ilium in the rear, the abscess drained and the appendix removed in that way.

I recall another instance where the patient was seen in consultation with Dr. Fitch, who is pres-

ent. It was a question in my mind whether the child, seven or eight years old, had trouble with the gall bladder or the appendix. I have only seen one or two cases in my entire experience where there was any gall bladder trouble in a child of that age. This case followed influenza two years ago during the epidemic which we had here. The abdomen was opened as though we were going to find trouble about the gall bladder region because the child complained of pain in that situation. A curious thing in this case was that the child had congenital absence of the ascending colon. The cecum began at the level of the liver, the appendix was attached to the gall bladder and was gangrenous. I have seen any number of anomalies along this line and in such cases the symptoms are always more or less deceiving.

I recall one instance where it was a question whether the child had appendicitis or partial obstruction of the intestine. The attack developed suddenly, the child never having had any trouble until a day or two before being sent to the hospital from Anderson County. The abdomen was opened as though we were going to perform an ordinary appendectomy. We found that the child never had in his life what is known as the ductus venosus. Where the umbilical cord goes to the liver, forming the round ligament, nothing was found, but the duct had extended downward and had joined itself to the outer portion of the cecum which had a very long mesentery, and where the duct joined the cecum it looked almost like placenta with veins extending in every direction. The long mesentery had permitted a loop composed of ascending colon and ileum to double itself over the abnormally placed ductus venosus, and the child had partial obstruction. The said ductus venosus was excised which allowed the intestine to liberate itself. There was no trouble with the appendix. The child made a quick recovery.

Protozoon in Relation to Typhus.—Montfallet relates experiences which have convinced him that the virus of typhus is of the herpetomonas genus, without flagella, and intracellular. He regards the herpetomonas as piroplasmas in a farther advanced stage of evolution. It probably is akin to *Herpetomonas equinus*. These conclusions are the result of years of research and experiments.

Femoral Hernia.—The obliteration of the femoral canal is realized by passing a needle through Poupart's ligament and deep through the pectineus muscle and back again. The loop of the and another of muscle are held in place with catgut.

DIAGNOSIS OF INCIPIENT PULMONARY TUBERCULOSIS.*

By W. T. McCONNELL, Louisville.

My principal reason for writing upon this subject grows out of the fact that practically one person in ten dies of pulmonary tuberculosis, and that nearly every patient who thus perishes has consulted his physician while the disease is yet easily capable of being arrested, the patient, himself, often little suspecting the true nature of his malady. And yet records in the various sanatoria show that most of these cases were never diagnosed until they had passed into a more advanced and hopeless stage.

The progress of the disease in the early stages is so slow and insidious that many months, or even years, may intervene between the primary infection and the time when it becomes a clinical entity. During this time, while it could not be said the patient is free from tubercles, yet the symptoms are so slight that he does not seek professional advice concerning them, and the physician is not called upon to make a diagnosis during this stage. In fact, during this time about the only manifestation is a sensitiveness to bacillary products, such as tuberculin.

A word about primary infection. Practically all city dwellers receive this primary infection. It has been estimated that 20 per cent of all children are infected by their second year; 50 per cent by their fifth year, and of the remaining 30 per cent, more than two-thirds of these by their fourteenth year. This infection does not mean clinical tuberculosis, and the tubercles formed are not always in the lung.

But our discussion will embrace that stage of the disease when, clinically, the patient first consults his physician, probably thinking he is "run down," or has "malaria," or "not feeling right;" and when, physically, the pathology is confined to not more than one lobe of one lung, or a very small portion of one lobe of each lung.

The fact that so few cases are diagnosed in their incipiency makes it clear that there are many difficulties in the way of definite diagnosis; it shows that there is no conclusively pathognomic set of symptoms or signs whereby we may easily reach our conclusions.

There are a few characteristics of the malady, however, which are fairly constant, such as progressive loss of energy, fever, gradual decline of weight and poor appetite,

*Read before the West End Medical Society, of Louisville.

each extending over some months. To this may be added neurasthenia and prolonged convalescence from any disease. While these symptoms may be carried by other infections, yet this group should put us on our guard, and prompt us to investigation of further signs and symptoms.

Fever is one of the most important symptoms we have. The temperature should be taken morning, noon and night, and records made of the temperature excursion. Should the elevation at any time during the day reach even 99° F., and persist over a number of days, it is very significant, especially if unexplained by other conditions. Practically all cases of active tuberculosis, unless the patient is at rest, will show some slight elevation of temperature, if this is watched closely for a number of consecutive days. Fever, of course, as is true of any other one symptom, can be found in any number of other diseases. But the slight afternoon or evening fever, especially after moderate exertion, is typical of active tuberculosis.

In arriving at our conclusions in any given case, it is important to take into consideration, not only the symptoms of the patient himself, but his family history and surroundings. While we do not believe that a patient directly inherits pulmonary tuberculosis, yet a "lowered resistance" seems to characterize some families; and if several members of the immediate family have died of the disease, or if the patient gives a history of close association with a phthisical individual over a long period of time, it renders his symptoms much more significant.

There is often a short, dry cough in the incipient stage. This is a non-productive cough, and comes largely from some slight irritation in the upper respiratory passages. Some observers claim that there is usually some laryngeal irritation in this stage. It is not until the advanced stage that you have the destruction of tissue with free expectoration.

As to the presence of tubercle bacilli in sputum, they are not found in the routine examinations in this stage. It is a very serious error to conclude that there is no active infection because no organisms can be found. Some investigators hold that if all sputum is collected for as much as 72 hours, and this treated with antiformin, the tubercle bacillae are more likely to be found, if present, in the precipitate; or that this precipitate injected into the peritoneum of the guinea pig will often produce typical lesions within 3 to 6 weeks. The presence of albumin and alveolar cell means alveolitis, and as tuberculosis is an alveolitis in its earliest pathological manifestation, these chemical and

cytological findings are somewhat significant.

At one time the various tuberculin reactions were considered of great value. The Von Pirquet, the Moro, the conjunctival and other tests were developed and enjoyed in turn a degree of popularity. But in view of the fact that nearly all adults have at some time been the hosts of these bacilli in greater or less numbers, these tests showed a number of positive reactions far too large to be of much practical value, except in young children. An active infection in an individual of fair vitality will usually give a strong reaction; yet if the vitality is low, as is so frequently the case, the reaction will not be stronger than you get in the usual quiescent or arrested case. Then a case which is clinically arrested may give a marked reaction.

The physical findings of the incipient stage may or may not be of great importance. A given case may be very active, and the physical findings may be practically negligible. On the other hand, the physical signs may be rather well defined and yet the symptoms be relatively insignificant. As usually investigated in general practice, the symptoms bear a vastly more important relation to the present condition of the patient than do the physical findings. In no part of the investigation will as much depend upon the specialized skill and experience of the investigator as in the physical examination. The signs so easily determined in the later stages—wasted frame, the hectic flush, marked muscular degeneration, large areas of dullness over the chest, extensive rales of various types, cavity formation, hemorrhages, copious expectoration containing the tubercle bacilli, loss of voice, night sweats—all or any of these things mean a condition far in advance of the one I am describing; and yet the writer has seen more than one case with most of the signs just mentioned, in whom tuberculosis had never been diagnosed, and the credulous relatives assured that the patient had merely bronchitis and malaria. I have seen a sufficient number of these far advanced cases come into the sanitarium, previously undiagnosed, to convince me that this condition of affairs obtains far too frequently.

The physical signs we usually expect to find in the early active stages of pulmonary tuberculosis are: first, slightly impaired resonance over the area involved. This is one of the most difficult signs to elicit, but may be detected by light percussion, beginning near the base, and progressing toward the apex of each lung, continuously comparing corresponding areas in both lungs. The amount of musculature, the size of the patient, all

conspire to make difficult the determination of the degree of impaired resonance.

Then the presence of rales. Rales in the chest do not mean tuberculosis any more than tuberculosis in the chest means active tuberculosis. Few chests in which auscultation does not reveal some crepitation. The most significant rales are those over the apex. Persistent rales around the clavicular region anteriorly and above the second or third rib posteriorly practically always mean tuberculosis, past or present. The post-tussel rale is of real importance. This is heard by having the patient take a forced inspiration, then a forced expiration, then giving a short, quick cough while the lung is, as nearly as possible, empty of air. During inspiration following this will be heard a shower of fine, soft rales. When these can be heard, they usually mean activity. The mucous rale, the sibilant, sonorous, wheezing, "bubbling" and "clicking" rales are characteristic of other stages. Rales over the bronchi and at the bases mean but little.

By having the patient count to three repeatedly in a loud whisper, an increase in transmission of whispered voice is found over areas of infiltration and consolidation. Vocal fremitus is of little value in this stage. The breathing is usually higher pitched, especially the expiratory note, often approximating the breathing of an early pneumonic condition. At times, however, this sign is difficult to determine, except by careful comparison of the two lungs.

On palpation the muscles over the area of activity at first show a heightened irritability with some muscle spasm; later when muscular atrophy begins, the muscle will have a slightly doughy consistency compared to those of the corresponding area in a normal lung.

The affected apex does not show quite as great a respiratory excursion as does the normal.

Physical examination usually shows that the right apex becomes involved earlier than the left.

Other signs are being heralded frequently as having significance in determining early activity, but most of these are of so recent sponsorship as to be of more or less unverified import.

The last word could hardly be said in a positive diagnosis of active incipient tuberculosis without an x-ray examination, both fluoroscopic and with plates. The stereoscopic plates are by far more satisfactory. In fact, a flat plate reading tells little if anything of incipient activity. The shadows in this stage

are so delicate that they are hardly discernable on the flat plate.

In conclusion and review it might be said that the symptomatology offers our most fruitful field for investigation in this stage. The physical examination may be made to confirm the symptoms, and the x-ray to confirm both symptoms and physical findings.

Given a case of progressive loss of weight, appetite and energy extending some months, a slight elevation of temperature after mid-day, a history of more or less prolonged association with an open case, or belonging to a pathisical family, and excluding chronic infection in teeth, tonsils and appendix, the diagnosis is very strongly presumptive. So strong, I feel, that in the absence of any further means of investigation, the future safety of the patient would justify a positive clinical diagnosis of pulmonary tuberculosis. If much importance is to be attached to physical findings and x-ray, examinations should be repeated every four to six weeks and progress noted before making a final diagnosis.

If each of us could spend some time within a tuberculosis hospital and witness, day after day, the miserable deaths these patients die, and realize that this is probably the most curable of all chronic diseases; that during the long, long course of its progress there is ample time for observation and investigation; that more people die of this disease than any other; that most of them could have been saved by early diagnosis, it seems to me we would certainly do all in our power to become more proficient in our diagnostic ability. That we might be of greater service to these patients while yet there is hope of saving them as useful citizens, and also be instrumental in preventing their becoming a prolonged burden and menace to society, finally to perish by such a miserable and lingering death.

Early Diagnosis of Gastric Ulcer.—The main thing, Durand and Lutier remark, is to think of the possibility of gastric ulcer; it is much more frequent than generally supposed. The long array of means at our disposal show that it is possible to detect ulceration in the digestive tract.

The following articles have been accepted by the Council on Pharmacy and Chemistry, for inclusion in New and Non-official Remedies:

Armous & Co: Corpus Luteum Tablets. Five grains.

David B. Levy: DuBois Iodoleine, Injectable, Ampoules, 2 Cc.

E. R. Squibb & Sons: Fat-Free Tincture Digitalis.

VENEREAL DISEASE AT STATE REFORMATORY.*

By E. C. ROEMELE, Frankfort.

In presenting this paper to you I have no idea of imparting to you anything new as regards the treatment of syphilis or the administration intravenously of neosalvarsan; but I would not be doing justice to the men who helped me if I did not say something about their skill.

It must be remembered that all my assistants in this work were prisoners, who had never had any experience whatsoever, and most of them had never even heard of treating syphilis in this manner.

During the first week of September, I took charge of all the syphilitic patients in the Reformatory at Frankfort. There were at that time 1047 inmates on the male side, and 27 on the female side. It was necessary, of course, to take a specimen of blood from each and every one and have a Wassermann made therefrom. Just a few words as to how these Wassermans were taken. Realizing that if the patients were either standing or sitting in an ordinary chair that one's back would get very tired from taking any great number of specimens, I had a specially constructed chair made, the seat of which stood about three feet from the floor. This put the patient's arm so that the desired vein could be reached without stooping on the part of the operator. Having all of the assistance that was necessary, my method of taking the Wassermans was as follows: One hundred patients were brought up at a time, and their shirts and undershirts removed; an assistant (a prisoner) washed his arm with soap and water in the anti-room; he was then brought into the operating room and placed in the chair—at the same time the assistant was washing another man's arm, and so on. Another assistant opened a container, handed me the bottle and needle and handed the rest of the container and the card which accompanies it to another assistant, who took his name, number, age and filled in the card. Another assistant standing to the left of the patient applied the tourniquet to the arm and instructed the patient to clench his hand into a tight fist, while another assistant wiped the arm with alcohol. I then plunged the needle into the tissues immediately next to the vein, and while the needle was under the tissues, side-tracked it directly into the side of the vein and withdrew the blood. Immediately after withdrawing the needle,

another assistant had his gauze ready, saturated with iodine applied it over the wound, using pressure, lifting the patient from the chair, and he was sent into an outer room where the gauze was applied with adhesive plaster by another assistant. The bottle of blood was handed to the assistant who had filled out the card, who then placed the bottle together with the card into the container and screwed on the cap. In this way we were able and did take 60 specimens an hour.

I wish to mention that out of the 1047 male patients, there were 428 cases of syphilis—a percentage of about 41 per cent. Of the 27 females, 24 had syphilis—a percentage of about 88 per cent.

On the 20th day of September we began treating them with neosalvarsan. Since it was necessary to give each man six injections of neosalvarsan, and because of the fact that I was very busy with my private practice, I could not spend too much time each day at the Reformatory, I had the 428 men divided into two classes, taking the first class for the first six weeks and the second class for the next six weeks. The record was made in the following manner: there were about 228 men in the first class. These were divided according to the six days of the week. Those men who were treated on Monday were again treated the following Monday, and so on. And those 38 that were treated on Tuesday, were treated the following Tuesday, and so on, until all of them had received their treatments.

Frequently it would so happen that before a patient had been given the six complete treatments that his time was either out or he was paroled or had received a pardon, in which case, I would use my authority as County Health Officer and quarantine him, giving him, of course, his choice between staying at the county jail or at the Reformatory. However, he was not compelled to work. Of course, in each instance, they preferred remaining at the Reformatory under quarantine. In this way not one escaped taking the full treatment.

Now then, a few words about the technique. This was in a great measure the same as our technique in taking blood specimens. And while I do not claim anything that any other clinic cannot claim, yet I do not think that any other clinic ever kept any better records or were quite as thorough as we were; but this is entirely due to the fact that the warden at the Reformatory gave me absolutely unlimited help. Each and every patient was weighed after each and every injection; and the most singular fact to me in the world is that every patient without a single excep-

*Read before the Franklin County Medical Society.

tion gained in weight—one as much as ten pounds in a week. However, the average was $2\frac{1}{2}$ pounds each man per week. This is an experience which I have not had in private practice.

It might be well to mention right here that we had every conceivable kind of complication; we had rheumatism, all manner of sores and ulcers; one patient who had an ulcer as large as a walnut right to the side of his nose where you could almost see into his mouth, which had been there five years. Eighteen were chronic sufferers from rheumatism, hardly able to go about. There were four who presented every symptom of pulmonary tuberculosis, who had wasted away almost to nothing, who had night sweats and coughed, and of course practically none of these men were able to do any work. Today each and every one of those men are working: these four tubercular patients have stopped coughing and are apparently in perfect health. Instead of being pulmonary tuberculosis, they were pulmonary syphilis. As a result of these treatments, the efficiency of these 428 men has been increased 75 per cent or more.

Just a few words about the technique. Of course the gravity method was used, and we had the same efficiency as regards the assistants in this as we had in taking the blood specimens. The patients were prepared as before, and the needles and everything thoroughly sterilized before I arrived each day to give the treatments, and, of course, a fresh needle was used for each man. After the patient was placed on the table, his arm having been previously washed with soap and water, and alcohol applied, the needle was then plunged into the vein as in taking the blood specimen, and when the required amount of fluid had flown into the vein, the needle was withdrawn and handed to an assistant, whose duty it was to immediately allow cold water to run through the needle, forcing the water through with a soft ear syringe to prevent clogging, and the needle was immediately thrown into boiling water, and another patient placed on the table and treated the same way. The needles were sterilized both after and before using, to prevent any infection among the assistants.

We began using 0.6 grams for the first dose; 0.75 for the second dose; and 0.9 for each dose thereafter. To prevent the solution from deteriorating and to keep from losing a moment's time, one of the assistants was trained while the second to the last dose was being administered to file the neck of the ampoule, but not to break them off. Then immediately, while the last dose was being given,

he would break off the necks from the ampouls, drop the contents of each ampoul into the distilled water, and immediately mix them. Then, just as soon as the last dose was being administered a fresh solution was ready, thereby avoiding any delay in having to wait for the freshly prepared solution—nine doses being made up at one time. We administered $37\frac{1}{2}$ cc. to each patient. Our record per hour was 30 patients. This, of course, could not have been accomplished except for the skill of my assistants, whom I beg you to remember were prisoners.

The only thing for which we claim originality is this: most of the clinics use rubber bands on the glass cylinder to indicate the doses. We tried this the first day or so, but found that in lifting the cylinder from the standard that these rubber bands would invariably be moved either up or down. So we discarded their use and took a piece of adhesive plaster one-half inch wide, and with a pencil made the marks thereon to indicate the dose, and it served its purpose exceedingly well. This method is still in use.

As to the preparation of the patients for the injection, will state that the injections were given at 11 in the morning, five hours after the patient had breakfast. He was then given no dinner whatever, but was allowed to eat supper.

As to the reactions, there were practically none. I distinctly remember not more than 4 men ever had to go to bed, and not in a single instance was there any untold effect while on the table or immediately afterward. It was never necessary to use atropine or any other preparation to resuscitate the patients. A few did within a few hours afterward become nauseated and have chilly sensations, but not a single one collapsed or was seriously sick.

I wish to state that the men were sent direct from the operating room back to their shops to work, and in a few instances where a chill or nausea came on in a few hours afterwards, they were allowed to stop work; but only four were ever ill enough to go to bed. One patient presented a very peculiar condition. He did not become ill, but five or six days after taking his first injection his skin peeled off, over his entire body in sheets as big as a sheet of legal cap paper; but it caused him no pain or any other inconvenience.

You will agree with me that the use of mercury hypodermically is quite painful. You can also readily understand that men in prison are great malingerers and wish to stop work for the most trivial injury. Therefore, had we used mercury in connection with our

other treatment hypodermically, every one of these men would have complained of pain and given it as an excuse not to work. Therefore the mercury was used by inunction. This was started after he had received his fourth dose of neosalvarsan. He was instructed to use the mercury, rubbing a piece the size of a hickory nut into the body, changing the site from day to day, using it each day except the day on which he received the neosalvarsan. All of them were of course instructed as to the care of their diet, so as not to become salivated. Notwithstanding these instructions, there were eight cases of salivation that came back for treatment for that condition.

Now, a singular fact is this: when we began the treatment of these syphilitic patients, we treated men who had been there anywhere from a day to 15 years. However, most of them were old-timers, and, as I told you a moment ago, the percentage was almost 41 per cent. We finished treating these patients on the 11th day of December, 1920. Since that day we have made Wassermanns in each and every new arrival at the Reformatory, up until the present day. The percentage of cases of syphilis now is less than 10 per cent on the male side and less than 5 per cent on the female side. It certainly does afford me a great deal of pleasure to attribute this improved condition to the fact that throughout the state we have free venereal diseases clinics, where patients can and are being treated for these diseases. In taking blood from the older inmates, they could not realize what was being done; but almost invariably when we take the specimen of blood from a new arrival, he smiles and says, "I have had that done before," with the statement that his blood either came back negative or that he has had treatment. This is especially true of those cases that come from those parts of the state where these clinics are located.

I wish to state, and it is indeed with pleasure that I do so, that this clinic is being continued, and a specimen of blood is taken from each and every prisoner immediately upon his arrival at the institution, regardless of where he or she is from and regardless of whether or not they state that one was taken at the jail just prior to their coming to the Reformatory. Those showing a positive reaction are given complete treatment.

In conclusion I wish to thank the State Board of Health, Colonel Joseph Byers, the Prison Commissioner, and Colonel W. H. Moyer, the former Superintendent. These were the gentlemen who recommended that this work be done. And I also wish to thank Colonel H. V. Bastin, the present Superin-

tendent, under whose term the clinic is now being continued. These men have cooperated with me in every possible way to make this clinic a success, and, without them it would not have been done. They are proud of what has been accomplished, and they have a right to, because so far as I know this is the only institution in America that has treated each and every case of syphilis within its walls and is continuing to do so.

REFRACTION OF THE EYE.*

By A. D. BANFIELD, Catlettsburg.

As the members of our society are mostly all physicians in the general practice of the profession, I have written mainly of the theory and principles of refraction, and the structural elements and parts of the visual apparatus, their nature and respective functions or part in the production of vision, as I feel this would be more entertaining and interesting than the details of the many methods and ways of detecting errors of refraction and their correction by properly selected and fitted eye-glasses.

Refraction is the change in direction of a ray of light when it enters obliquely a medium of different density from that through which it has previously moved. Refraction out of rarer medium into a denser, is made towards the perpendicular or better expressed, however, in eye refraction towards axial ray. It is my purpose only to consider refraction of the normal eye and errors of refraction due to anomalies of the ocular mechanism and not those due to injuries, corneal asymmetry and distortions caused by disease. We consider the mechanism and refractive conditions of an eye normal when refrangible parallel rays are focused exactly upon the retina at a time when entire relaxation of accommodation is present, forming perfect images of exterior objects on the retina in exact order. This we term static refraction in contradistinction to dynamic refraction which is refraction increased by accommodation.

There are refractions of other media, as glass, water, diamonds etc., that can be studied satisfactorily in a purely scientific way, but the refraction of the eye cannot well be satisfactorily studied without a thought of the associated and inseparable visual function which to me is the most enrapturing and mysterious phenomena of all the strange vital phenomena of human existence. It brings us at once into rational contact and relation with all exterior things of the world in regular order; their size, shape, relative positions,

*Read before the Boyle County Medical Society.

color, tints and a consciousness of their nature, distance away, whether near or far, below, above, moving or still, an incomprehensible and astonishing manifestation of omniscient and omnipotent force and power.

It might help us some, perhaps, to think briefly and concisely of the anatomy of this apparatus, the eye-ball. It is situated in the orbit where it is protected from injuries and has most extended range of sight. It is spheroidal in form, having the segment of a smaller and more prominent sphere engrafted upon its anterior part. It is from this circumstance that the antero-posterior diameter exceeds the transverse diameter by about one line. The segment of the larger sphere forms about five-sixths of the eye globe and is opaque; the smaller sphere forms the remaining one-sixth and is transparent. This is the cornea, the external protective anterior tunic of the eye-ball and its antero-posterior diameter from the corneal apex to the corneal radius is about one line. It is not exactly circular, being a little broader in the transverse diameter than it is in the vertical. This I am most sure is the cause of most cases of hyperopic astigmatism having vertical axis rather than horizontal axes.

All bodies are considered luminous and send off light in lines or rays, in every direction, coming to us parallel from objects 20 feet away. This distance is designated the point of infinity and rays of light coming to us from such bodies are divergent and increase in divergence as the objects approach nearer us than 20 feet, requiring increased refractive power or force to bring these rays to a focus on the retina which is essential in the production of normal vision. And furthermore, these rays must be focused precisely on the fovea of the macula lutea, the yellow spot, to have perfect vision. The necessary increased power of refraction of normal eyes is supplied by accommodation or the action of the ciliary muscles, in those whose accommodation is not weakened by age.

The action of these muscles controls our vision for all points nearer than infinity. The refractive media of a normal eye bring parallel rays to a focus 22mm back from the cornea, therefore, we can understand why presbyopes or those from 45 to 50 years old, the age when accommodation begins to fail, require refractive glasses in aid of accommodation at the near point of punctum proximo.

Old age brings on another impairment of vision by changes in the crystalline lenses. They become slightly tinged with amber color, and grow harder and flatter on the back and front which lessens the power of refraction and vision so much so it will some-

times change an emmetropic eye to a hypermetropic eye, then we do not only need glasses for failure of accommodation but also for hypermetropia. At the presbyopic age we only need glasses for the near point and when we want to see at a distance the glasses are removed to enable us to do so and replaced when we want near vision again. But still later when we remove our presbyopic glasses we find we do not see so well at the distant point and this failure of vision still increases until static refraction is no longer sufficient and we are forced to put on refractive glasses mainly, for hypermetropic condition.

As stated at the beginning, refraction is the change in the direction of a ray of light when it enters obliquely a medium of different density from that which it has previously moved. In looking over the anatomy, construction and build of the visual apparatus, we find it a globe five-sixths of which is opaque and the other one-sixth is transparent with a convex anterior surface forming a complete refractive apparatus, and all rays of light except central or axial rays must enter it obliquely with a consequent angle of refraction equal to the angle of incidence. At the cornea begins the refraction of all rays entering the eye and by the aid of the other refractive media within the eye-ball, as the aqueous and vitreous humors of the anterior and posterior chambers, the crystalline lens, and vitreous body bring parallel rays to a focus, the focal length of these media being 22mm.

The acuity of vision of eyes anatomically normal and free from anomalies with requisite favorable contributory surroundings, is not equal always in accuracy of vision. This is claimed by reputable authorities to be the results of the perceptive elements of the retina not being properly developed in children and infants, due most likely to non-use or congenital causes. Such a condition is simply weak vision. When patients come to us with impaired or reduced acuity of vision from any cause or causes they invariably state that they have had weak eyes for months or years perhaps. This weakness we usually find is due to atrophy, to a greater or less extent, of the nervous apparatus of vision as in optic atrophy, amblyopia, hemianopsia amblyopia exanopsia, or some form of obstructive pathological condition as cataracts, pterygia and corneal thickenings or opacities, varying from a mere hindering hazy corneal epithelium or nebula to a dense vascular pannus, the acuity of vision being proportionally reduced, but not from feeble vision function per se, as they naturally believe. Any reduction in vision that cannot be corrected or relieved

by glasses is due to pathological or abnormal conditions.

Now, I realize my inability to treat the subject of refraction and vision thoroughly from a scientific point of view, but have and will endeavor to bring some plain facts and thoughts on the subject before you which I hope may be interesting, helpful, and instructive to some extent. In this matter we are and have been confused to a degree, due to our imperfect knowledgs of the genuine elements and true nature of light and its transmission which of course are the main factors we have to deal with in refraction and vision. Dr. De Schweinitz, an eminent ophthalmologist, says in his writings: "By light is meant that physical force or form of energy which, acting on the sentient elements of the retina, causes the mental perception of the specific energy that is sight or vision.

From each point of the surface of a luminous body light or rays of light proceed in straight lines in all directions, and in order to explain the transmission of light it is assumed that throughout the universe there exists an exceedingly tenuous matter to which the term ether is applied. Exactly what the vibrating disturbances are which constitute light is not certainly known."

That is a very euphonious and interesting explanatory definition, but it does not convey to our minds any positive knowledge or conclusion of the real nature of light, however, we are confronted with similar staggering results in all our studies and investigations concerning primordial vitalizing energies, conditions and entities of all things.

I have spoken of the refractive apparatus and adjunct auxiliaries necessary to ocular refraction of light. The secondary parallel rays of light in passing through a normal dioptric media are brought to a focus on the retina with a visual angle that should and usually does subtend an arc of 5 minutes, a visual angle with a base less than 5 minutes is not appreciated by the retina.

The movements or rotation of the eye-ball have much to do with our amplitude of vision. By the action of the ocular muscles the eye-ball is moved in any direction turning on the center of rotation, a point on the optic axis about 14 mm. behind the cornea. A special and indispensable effect of the motility of the eye is the convergence of the eyes or visual axes without which vision at close range would be valueless. We could not fix objects and they would appear indistinct and double, that is crossed diplopia. We do not need convergence and accommodation at infinity but need both for points nearer than infinity. There is a definite relation we find between ac-

commodation and convergence induced by the guiding sense of vision.

In this connection I will say we learn that vision is greatly improved by cultivation and experience in the sense of visual guidance. A landlubber's vision a-shipboard is not so useful and trustworthy as that of an experienced sailor's. His power of distant vision and location of objects under observation with a reliable degree of certainty is not sufficiently accurate and trustworthy to be acted or depended upon.

A fisherman's experienced vision enables him to locate fish or other objects beneath water with surprising accuracy and correctness while with the mere inexperienced visual sense they are always located farther from us than they are. It is understood that the Indian could see distinctly and locate objects with more certainty at a much greater distance than those reared and living in cities.

Macbeth, on the occasion of the assassination of his guest and kinsman, King Duncan, King of Scotland, said:

Is this a dagger which I see before me,
The handle toward my hand? Come, let me clutch thee:

I have thee not and yet I see thee still.
Art thou not, fatal vision, sensible
To feeling, as to sight? or art thou but
A dagger of the mind, a false creation,
Proceeding from the heat-oppressed brain?
I see thee yet, in form as palpable as this
which now I draw,

Mine eyes are made the fools of the other senses,

Or else worth all the rest. I see thee still.
There's no such thing.

It is the bloody business which informs
Thus to mine eyes.

This citation is rather irrelevant, an expletive, a delusion, a visualized image of a morbid mind and distracted brain, and merely serves to illustrate in a way the difference between untrustworthy ocular vision in health and that of mental vision in a morbid brain and broken mentalization.

Dr. Ellice M. Alger, a reputable author and teacher of ophthalmology in New York City says: "Objects having the same visual angle will have equal retinal images and appear the same size. This is modified somewhat as the result of experience. For instance, a row of telegraph poles appears to diminish in size as their distance increases, because their visual angle becomes less, but we know them by experience to be of similar size, which leads our judgment to rectify the erroneous impression of our vision."

The crystalline lenses lie just posterior to the pupil of the iris and measure about one-third of an inch (8mm.) from side to side and a fifth of an inch thick and are suspended between the aqueous and vitreous humors by the zone of Zinn or suspensory ligament. This ligament attaches to the anterior capsule of the lenses, and blends with the ciliary muscles and controls the action of the lens in accommodation.

The retina, like the iris does not belong to the refractive group of vision, but are of equal importance in the production of vision. The iris by an act of dilation and contraction of the pupil regulates the admission of the necessary amount of light under all conditions for satisfactory vision. The retina is the termination of the optic nerve, and the percipient membrane of the visual mechanism. It receives all the visual sensorium of the brain where we have to conclude that by some manner of responsive cerebration the visual function is finished or completed.

Paper was discussed by Dr. T. W. Moore and Dr. Gibson, of Huntington, West. Va., and Dr. J. M. Salmon of Ashland.

ENDOMETRITIS.*

By A. R. KEMPF, Olmstead.

An inflammation or hyperplasia of the uterine mucous membrane involving, to a greater or less extent, the parenchyma of the uterus.

It is convenient, both in a clinical and a pathological sense, to divide the disease into two varieties, viz: (1) interstitial or functional endometritis and (2) glandular endometritis, or hyperplasia. Either of these two varieties may exist in the acute and chronic form but the chronic form may follow an insidious acute attack or may supervene in a gradual manner without being preceded by a recognizable acute attack.

Generally there are three forms of endometritis: the glandular, interstitial, and fungous. There is a form described as endometritis decidua which is a combination of the glandular and interstitial forms. Then there is the gonorrheal endometritis which is of the interstitial variety and very similar to the senile form.

The symptoms may be divided into: (1) Disturbance of the sexual functions; (2) Intermenstrual discharges; (3) Pain and discomfort in and about the uterus and radiating from the uterus; (4) Reflex disturbances; (5) General symptoms.

Menorrhagia is one of the most frequent symptoms in the early stages and in the glandular variety it often persists for a long time as the most prominent one. The flow may be moderately increased in amount, or be a profuse hemorrhage with the passage of clots; it may be prolonged, or may recur too often. In the later stages of septic or interstitial endometritis the menses are sometimes scanty. In certain acute attacks the menstrual flow is suppressed.

Dysmenorrhoea is common in cases connected with flexion, puerile cervix, or inflammation of the appendages.

Younger individuals are often subjected to the two above conditions, the chief causes being tight corsets, wet feet and cold and chronic constipation.

Sterility in women is most frequently due to catarrhal endometritis, resulting from a previous miscarriage. The principal causes are: obstruction of the cervical canal by mucus; and increased alkalinity of the cervical secretions.

Leucorrhoea is usually noticeable in the glandular variety and in the early stages of the septic. In the former the corpus secretes a thin, and the cervix a thick, clear mucus, both of which may be transformed into minute white coagula, at the external os, by the acid vaginal secretion, and appear at the vulva as a white or greenish-white discharge. In some cases the mucus is intermittently tinged with blood. In the septic variety the discharge is at first purulent, but later becomes mucopurulent and in time may be mucous or even watery in character. This may sometimes have a disagreeable odor.

Pain may be felt in the sacral or lumbar region, and may extend across the back or up the spine to the occipital region, or down the course of the sciatic nerve. Cutting or cramping pains across the lower abdomen or pubic region may be complained of, depending upon painful uterine contractions due to the expulsion or the attempted expulsion of the uterine discharges. There may also be some irritation of the bladder and rectum with pain in the vagina and pubic bones, and sensations as of prolapse of the pelvic organs are present in some cases. These pains are most pronounced during the exfoliation of the uterine mucosa.

In the intestines there is a gaseous distension with constipation, impaired digestion and the accompanying reflex disturbances.

The general symptoms in the acute form are chills, fever and other symptoms of inflammation and sepsis. In the chronic cases anemia and nervous debility persist.

Diagnosis: Endometritis must be differ-

*Read before the Logan County Medical Society.

entiated from angioma, tuberculosis, carcinoma and myoma of the uterine mucous membrane. The differential diagnostic points in distinguishing the disease from the aforementioned conditions may be tenderness of the uterus on bimanual palpation, sensitiveness of the endometrium at the internal os and fundus as demonstrated by the passage of the sound and the flow of blood and mucus following the withdrawal of the sound.

Etiology: Acute endometritis may result from trauma or taking cold during the menstrual congestion, such as suppression of menstruation from exposure to cold, excessive coitus, overexertion or blows upon the lower abdomen during menstruation. It may also be caused by infection, such as inoculation by gonorrhoeal pus during or following coitus; or it may result from the extension of sepsis from vaginal inflammation.

Under the head of trauma may come the lacerations of the cervix during labor or by instrumental dilatation, curettage of the endometrium, the introduction into the uterus of strong irritants, the use of intra-uterine stem-pessaries or poorly-fitting vaginal pessaries, irritating and unclean tampons, etc.

Displacements, obstinate constipation, miscarriages and abortions are etiological factors.

Chronic septic inflammation may result from one or more acute attacks or from infection by objects introduced into the vagina or uterine cavity whether by operation, examination, or improper attempts at medication.

Pathology: The mucous membrane of the cervical cavity presents the same changes as those of other mucous membranes. The uterus is found to be large, relaxed, and soft with the enormously enlarged blood-vessels characteristic of the later stages of pregnancy. The external os projects into the vagina as a swollen, greenish-black rough, friable mass. The whole cavity of the uterus is lined with the same greenish-black, ragged, necrotic tissue, the walls on section grayish red and edematous, the veins open and full of blood. The Fallopian tubes contain a turbid fluid. Extension along the Fallopian tubes to the fimbriated ends is likely to produce a peritoneal infection, or large abscesses may develop in the broad ligament or the adjacent pelvic tissues.

Treatment: For acute metritis due to suppression of the menses the flow should be re-established if possible in the early or congestive stage. As soon as possible after the suppression the patient should take a warm bath and go to bed. Hot drinks, hot poultices to the abdomen and groins, and hot-water

bags or bottles to the feet and legs should be employed. If the menstrual flow is re-established by these means within a day or two, the patient may leave the bed after the flow has ceased, but should lie down two or three hours in the middle of each day, and take but little exercise for three or four weeks. At the time of the next period she should keep to the bed and repeat the hot applications, etc., if the flow does not appear on time. The bowels should be kept open by salines. However, if the menses are not re-established within two or three days after their suppression, the patient should remain in bed for a week or ten days, apply counter-irritants over the iliac and suprapubic regions and take copious hot douches two or three times daily in the recumbent position. She should daily secure an evacuation of the bowels. Small tampons, saturated with a 10 percent solution of ichthyol preparation may be introduced high up in the vagina every other day. Tonics and an easily digested diet should be prescribed.

Acute metritis following labor or abortion calls for a thorough evacuation of the uterus by the fingers or curette, and, if septic symptoms persist, antiseptic intra-uterine douches every twelve hours (1-3000 mercuric chloride followed by sterilized water or 1 per cent creolin) and vaginal douches of the same character every six or eight hours. As the inflammation subsides hot douches, laxatives, tonics, rest in bed, etc., are indicated.

Displacements should as far as possible be corrected, stenosis relieved, and pelvic inflammatory conditions and tumors be treated or removed. Chronic glandular endometritis, along or in connection with chronic septic or interstitial endometritis, and all menorrhagic cases uncomplicated by pelvic peritonitis should be curetted. When the curette is employed due care should be exercised. Rough manipulation and undue pressure upon the uterine surfaces have been followed by untoward results. Curettage should be avoided when there is tenderness in the tissues besides the uterus.

Laxatives, tonics, massage, regulated out-of-door exercise, and restriction of coitus are useful adjuncts.

Endometritis with stenosis and pyometra (so-called senile endometritis) should be treated on the same principles as any pus-cavity, viz: dilatation of the cervix for drainage, and the washing out of the uterus with antiseptic solutions once or twice daily.

TWO CASES OF HEMORRHAGE FOLLOWING PERITONSILLAR ABSCESS.

By W. J. THOMASSON, Newport.

Mr. E. C. age forty-five with a history of frequent attacks of tonsillitis and quinsy all his life, was seen by me for the first time May 2nd, 1920, this patient an active business man with a history of diabetes. At no time were we able to find more than a trace of sugar while he was under observation.

He gave the history of tonsillitis with quinsy of a week's duration. Upon examination the left tonsil was much swollen, the uvula pushed to the opposite side and the swollen tissue gave every evidence of pus in the super-tonsillar space.

The abscess was opened, the tissue covering the abscess was very thin and the knife punctured it as readily as it would a toy balloon. A large quantity of pus was evacuated.

The following Wednesday was called to see this man and found the right tonsil swollen and an active quinsy present. This was opened, the abscess being rather deep, and but a small amount of pus was found.

On the morning of May 12th, or ten days after the first abscess was opened, while the patient was in the bath room, he was taken with a sharp hemorrhage and the loss of blood was estimated at one pint. The hemorrhage had stopped when I reached the patient, but a small amount of blood was found oozing from the site of the abscess on the left side.

The patient was put to bed and quietude insisted upon. He ate his noon day meal and had a very light supper, and at eight p. m. left his bed and walked to the bath room; again had a severe hemorrhage and when I saw him fifteen minutes after the hemorrhage started, the blood was pouring from his mouth and the bath room was covered. We estimated the loss as much greater than that occurring at the first attack.

This man was put to bed, morphia given and pressure made to the point of hemorrhage. His family physician and I stayed with him all night, and before leaving him the abscess space was packed with one and one-half yards one-fourth inch plain gauze. A consultation was held in the afternoon and the question of ligaturing the carotid was considered and rejected, for the mortality is high and the sequela following this operation is grave.

At this consultation the packing was removed and the cavity was the size of a small English walnut and a large blood vessel could be seen pulsating in the cavity. The

wound was again packed with iodoform gauze and repeated twice a day until the wound was healed. The gauze was lessened each time allowing healing by healthy granulations from the bottom of the wound. Plain gauze was used for the first packing because it was all we had and iodoform gauze could not be obtained at that time of the morning.

This man was kept in bed for two weeks, a nurse being with him night and day. He was not permitted to sit up or exert himself. He was given a good substantial diet and at the end of three weeks was able to get around his room and made a complete recovery.

He was given horse serum 1 c.c. every twelve hours commencing the morning after the hemorrhage and continuing until four doses had been taken. We had an anaphylaxis following which was unpleasant to the patient but soon disappeared under alkaline baths.

Mr. J. U. age 48, had tonsillitis followed by bilateral peritonsillar abscess. The first abscess ruptured spontaneously January 2nd, 1921; the other side rupturing January 5th, a few hours after the first abscess ruptured. There was a brisk hemorrhage from the site of the first abscess. The family doctor was called and the man continued to bleed and came into the hospital late in the afternoon.

When I first saw him blood was oozing from the left cavity behind the tonsil. This was three days after the rupture of the abscess. The cavity was packed with iodoform gauze, one yard of one-fourth inch gauze being used. Morphine was given at once and preparations made for the use of horse serum.

In going into the history of the patient it was learned that he was an asthmatic; the horse serum was not given but held in readiness in case a severe hemorrhage occurred.

The cavity oozed some all night but when I saw him at 1 a. m., the bleeding had stopped, the packing was removed and the wound was clean and no more gauze was used.

From the anaemic condition of this patient, I feel safe in saying that he had lost a large amount of blood before entering the hospital. At the end of one week this man returned home and made a good recovery.

In the first case, the bleeding occurred after a late incision of the abscess. The second case occurred after a spontaneous rupture of the abscess.

These two cases convince me that an early incision in peritonsillar abscess is much safer to the patient than a late incision or a spontaneous rupture, for if the abscess is left alone until late, the pus by necrosis or pressure may erode the tonsillar arteries or even the carotid, causing death.

Kentucky Medical Journal

PUBLISHED MONTHLY BY
THE KENTUCKY MEDICAL ASSOCIATION
Incorporated

Editorial and Business Office, Cor. State and Twelfth Sts.

Entered as second class matter October 22, 1906 at the Postoffice at Bowling Green, Ky., under act of Congress, March 3, 1879.

Subscription Price\$2.00
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BOOK REVIEWS

Creative Chemistry.—By Edwin F. Slosson. Illustrated 8 vol., 311 pages.

Here is a book on chemistry written especially for the layman, which assumes no previous knowledge of the science from the reader. It describes in plain language the modern processes of the chemical industries and in a vivid, unfailingly entertaining style explains the political and social effects of the achievements of the present-day chemists.

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"It is a book to own, to mark, to read aloud to the family."

Published by The Century Co., 353 Fourth Ave., New York City.

Optimistic Medicines. The Early Treatment of Simple Problems rather than the Late Treatment of Serious Problems.—By a former insurance man, F. A. Davis Company, Publishers, Philadelphia, Pa. Price \$3.00 net.

The author points out the many benefits resulting to the family which maintains frequent contact with some competent individual physician who, in this way, can become acquainted with the physical peculiarities of each family member, an advantage of the utmost importance in treating any serious disease.

Although written in simple, rather than technical language, a copious glossary is supplied.

Chemical Pathology.—Being a discussion of general pathology from the standpoint of the chemical processes involved. By H. Gideon Wells, Ph. D., M. D. Professor of Pathology in the University of Chicago, and in the Rush Medical College, Chicago. Fourth edition, revised and reset. Octavo of 695 pages. Philadelphia and London: W. B. Saunders Company, 1920. Cloth \$7.00 net.

The fifth edition meets the rapid growth of interest in chemical problems of medical and biological science. A new chapter has been added on Deficiency Diseases. The growing bulk of material on Reaction of Immunity has required a rearrangement and special chapters on Anaphylaxis and Allergy has been added. For the benefit of those whose studies in these subjects date back some years there has been added in an introductory chapter an epitome of the more modern views concerning the chemistry of the protein molecule, the composition of the animal cell and the principle of physical chemistry insofar as they apply to biological problems.

KENTUCKY MEDICAL JOURNAL

BEING THE JOURNAL OF THE KENTUCKY STATE MEDICAL ASSOCIATION

Published Under the Auspices of the Council

VOL. XIX. 

BOWLING GREEN, KY., OCTOBER, 1921

No. 10

EDITORIAL

ITINERANT VENDORS OF NOSTRUMS AGAIN.

The August issue of the Kentucky Druggist, the official organ of the Kentucky State Pharmaceutical Association, ably edited by Robert J. Frick, one of the leading pharmacists of Louisville, after publishing in display type on its first page an official opinion from Hon. Elwood Hamilton, attorney of the State Board of Health, in regard to a recent shrewd attempt of the shameless nostrum vendors who are still permitted in a few outlying counties to evade the penalties provided against their nefarious business by Sub-section 6, Section 2615 of the Kentucky Statutes, by an agreement with some thoughtless or weak druggist to sell and deliver their wares, endorses the law and the legal opinion in the following ringing editorial:

"THE ITINERANT VENDOR"

Our attention has been called by the officials of the State Board of Health to some illegal practices that are going on in different parts of the State. These practices consist of a transaction between an itinerant vendor and the retail druggist. We have been informed by the State Board of Health that warrants will be sworn out by state officials against any druggist guilty of being a party to these sales.

Having the interest of the druggists of the State at heart, we called on the State Board of Health officials to ascertain just what the legal status of the affair is. Just what the druggists should avoid so as not to conflict with the Statutes. We were very cordially received by Dr. McCormack, and the matter was thoroughly discussed. The writer agrees with Dr. McCormack that no reputable druggist would be a party to any scheme that

would assist an itinerant vendor to distribute his worthless nostrums among the public.

But, this profession, like others, contains some weak brothers who cannot resist clinching the almighty dollar, even if there is a question of them abiding by the law. It is for the benefit of our weaker brothers that we bring this matter before the druggists of the State. Therefore, we publish in this issue a very important communication that passed between the attorneys of the State Board of Health and its officials. We wish that each druggist in the State would read carefully this communication and be governed by it.

We would however, like to make this comment. If it is illegal for an itinerant manufacturer or vendor of a patent nostrum to stand on the principal corners of a town or village and attract crowds by having songs, dances and minstrel performances, and then to exploit the wonderful curative power his medicines contain, telling his listener (when they are interested enough to buy) that they can be purchased from the nearby drug store—why is it not contrary to this particular statute when a patent medicine manufacturer buys valuable space in the daily newspaper to advertise the wonderful remedy and cure his preparation will perform, even though it has been proven by the experimental station as being worthless? These manufacturers spend thousands of dollars and take up page after page of the daily newspaper exploiting the wonderful things these nostrums will do. Then in extra type they say that this preparation is sold only at some particular drug store. Just where the difference comes in we fail to see, as the manufacturer of the said nostrum is no more of a registered druggist than the itinerant vendor. He only distributes and exploits his ware in a more costly and dignified manner.

It is truly disgusting at times to pick up the daily papers and see page after page of false testimonials that were purchased for

from \$5.00 to \$25.00 (all according to the prominence of the person in that particular neighborhood) by giving away a bottle of the worthless stuff. It would indeed be a blessing to the Public if the State Board of Health could put a stop to this injurious and disgusting traffic. Every druggist should do everything within his power to discourage same. We are of the opinion that more harm is done the public through this extensive newspaper propaganda than through the itinerant vendor, because all of this newspaper propaganda gets into the homes and by the bedsides of the sick, while the itinerant vendor only reaches a class that will congregate at street corners. As reputable druggists, we would welcome some plan to annihilate the patent nostrum fakirs from our daily newspapers."

Submitting the above editorial to Mr. Hamilton, who, confining himself to the first three paragraphs, with the suggestion that additional legislation would be required to meet the comparatively recently adopted methods of certain patent medicine manufacturers and chain drug store vendors, commented as follows:

"Replying further to your inquiry in regard to the liability of a druggist under Sub-Section 6, Section 2615, of Carroll's Statutes, you are advised that where a druggist sells medicines from a drug store immediately after they have been advertised by an itinerant medical company, of two or more persons traveling as a troupe or company, such traveling medical company directing the purchaser to call at the drug store, the druggist becomes the agent or member of the itinerant medical company and must have the license provided for in Sub-section 6, Section 2615, or subject himself to the penalties for selling nostrums as part of an itinerant medical company without license."

In order to carry out the other timely and valuable suggestions of the above editorial, as suggested by Mr. Hamilton, additional legislation will be necessary, and it gives the JOURNAL pleasure to pledge to the Druggist and the State Pharmaceutical Association the cordial support of the organized medical profession of Kentucky for any measure they will propose intended for care of this glaring evil, menacing alike to the welfare of sick and to the good name of their highly useful and indispensable calling.

SCIENTIFIC EDITORIALS

ENURESIS.

There is no pathological condition of childhood which is so aggravating to both mother and child as bed wetting. All sorts of theories have been advanced as to its cause and a correspondingly large number of drugs have been tried for its cure. It has been a common practice with even our best physicians to try one drug after another till the list was exhausted and then give up in disgust and wait for time to effect a cure. In recent years much attention has been given by pediatricians to pyelitis and its relation to other pathological conditions of childhood. It has been found that many of the conditions which were accompanied by fever and general malaise and which were attributed to anything from teething to tuberculosis are in reality due to pyelitis. It has also been found that bed wetting is often the direct result of this disease when the condition has become chronic. It has been known for some time by the specialists but not generally known by the general practitioner that this troublesome condition can be relieved in a large percentage of cases by the administration of creosote. It is given in three minim doses to a child of five years in a capsule three times a day. For younger children and for those who cannot swallow a capsule the medicine may be given on sugar, varying the dose according to the age. Some of the men who are using this treatment say that they rarely have a case which does not respond quickly. It is not claimed that the pyelitis is entirely cured by this procedure but that the symptoms are relieved and that is what the tired mother is looking for. If this treatment is anything like as efficacious as it is claimed to be it should be known not only to the profession but the knowledge should be the common possession of every mother in the country.

R. H. COWLEY.

Effect of Alkali on Vitamin B.—The experiments made by Osborne and Leavenworth confirm the observations of those investigators who have reported the destruction of the water-soluble vitamin B when heated with alkalies. It thus appears that in attempting to concentrate, or isolate, the water-soluble vitamin B dilute alkaline solutions can be used without materially affecting its activity provided a low temperature and a short time of exposure to the alkali are employed.

PRESIDENT'S ADDRESS

MEDICAL EXOLUTION AND RECONSTRUCTION.*

By J. A. Stucky, Lexington.

To-day begins my service as the President of this old, time honored society; today my real work begins. A year hence you will know whether I have been a faithful servant, or whether I have hidden what little talent I have in a napkin. It is not my intention to make this President's Address a Swan Song, and yet the Presidency of this Society carries with it a feeling of finality. I am reminded as I look over this audience of the many changes which have taken place since 1878, when, soon after receiving my diploma, I attended my first meeting.

The occupant of the position of President of this Society is likely to become introspective and inclined to sum up. He perhaps feels that many of you think he has passed his most important professional mile-stone, and though he does not admit it, yet it is true that the years automatically count themselves up and pass in review, and the last milestone of all seems immeasurably nearer.

I have noticed that the seasons are getting shorter, the spring is not inclined to linger, the summer not so hot, the rich colorings of autumn not quite so bright, the winter has less snow and ice, and altogether the wheels of time are turning more rapidly.

As a Society we are not to live on the momentum of past achievements, but on the other hand we are still to be producers though the arm chair is tempting to all of us. Success, and we have all tasted it, first slips a pillow under our feet and then one under our heads, or endangers us by intoxication, leading to over-confidence or shameful conceit. Ours is an ancient, honored prestige, plus the heritage left by the pioneers and pathfinders in medicine, and this Society must continue to be collectively and individually interested in all matters pertaining to the art of medicine or its mantle will begin to slip.

The early history of medicine centers around Old Transylvania, and what those men, few in number, and with meagre facilities did for the history of medicine in these United States, overcoming innumerable obstacles, oftentimes blazing their way through the wilderness, going to cabin homes and giving of their science and art in the restoration of the human body to health and the saving of human life, we in this day with our great-

ly increased numbers, and more perfect and adequate facilities can do.

When this Society was smaller, it was customary for the President to address you on new ideas or ideals of organized medicine, or the progress of medical science during the preceding year, and he was elected because of long service or his eminence in scientific work, but today things have changed. We have grown until now we have a professional day when the various departments or sections meet before the general meetings begin. These sections are as large or larger than the old society used to be and in the addresses of the chairmen of the various sections, and papers read by the members, you get what is new in scientific medicine, so I will be pardoned if I digress from the time honored custom. A feeling of unrest, Bolshevism, and dissatisfaction has been going on for several years—during which time the laity, so-called, have become anti-religious, anti-organization, anti-medical, culminating in the great catastrophe of the late World War. Now we are in the midst of a readjustment along all lines, and the doctor can no longer close himself up in his shell and say that he has no interest outside of medicine, for his place is in the trenches on the front line as a citizen, where he can do his duty as such, and show the public that he has the conviction of his belief.

The purpose of this society is to federate and bring into one compact organization the entire medical profession of the state; to extend medical knowledge and advance medical science; to elevate the standard of medical education and to secure the enactment and enforcement of just medical laws; to promote fraternal intercourse among physicians and guard and foster their interests; to enlighten and direct public opinion in regard to the great problems of public health so that the profession shall become more capable and honorable within itself, and more useful to the public in the prevention and cure of disease and in prolonging and adding comfort to human life.

Along all these lines we have progressed, but there is yet much to be done. The extension of medical knowledge, the advancement of medical science and elevating of the standard of medical education is being done to a commendable extent, but we feel that our University should amplify its curriculum, especially along the lines of physiotherapy, which was advanced and developed during and since the war, in the reconstruction and rehabilitation of men injured physically and mentally during that crisis.

Especially do I urge greater and more active interest in our University of Medicine.

*Delivered before the Kentucky State Medical Association, Louisville, September 19, 20, 21, 22, 1921.

A seeming indifference on our part is both misconstrued and misinterpreted. Why should we not aid history in repeating itself, by making our institution more than equal to the best?

Why should we not have as its adjunct a Post Graduate School of Medicine of the Standard A 1.? We have the prestige, the men, equipment and clinical material.

The men who are teaching fundamental subjects to undergraduates are earning their salary three times over, without asking them to lengthen their hours by teaching Post Graduates for nothing. I feel with Mosher,* that our "Post Graduate schools must be endowed, and if any philanthropist wishes to help humanity let him endow Post Graduate teaching in a few of our largest medical schools. Until that time comes, we shall dream dreams, set up standards and gaze longingly towards the promised land, but we shall never set foot on it. The vistas which are opening up before medicine at the present time stagger the imagination when it tries to see into them. Take the single problem of immunity, what this means in terms of chemistry, in terms of fundamentals of disease, or in terms of prevention and cure of disease have hardly been sensed as yet, neither has the great problem of anaphylaxis, and while surgery has remained quietly at home piling up its quota of successful operations, medical men suddenly imbued with the holy fire have traveled the world over, sometimes alone, sometimes in groups, to study diseases new and old. No country has been too remote, no plague too deadly to keep them away. They have seen the vision and have been guided by it. Their surgical brothers meanwhile have been busy mainly with repair jobs. Action and quick accomplishment which used to be the prerogative of the surgeon, have become the prerogative of the medical men as well."

Progress and successful attainment depend on harmony, cooperation and enthusiasm among the members of our profession. Let the prestige and memory of the past be held sacred: honor the memory of the pioneers by doing as they did—make the practice of the science and art of medicine and its teachings in Kentucky equal to the best. It was done at one time by a few, with meagre facilities and equipment, but it can be done easier and better now by the many, with their elaborate facilities and adequate equipment.

The lay public and the physician need to completely understand each other—and when we have changed our evasive and indifferent method of dealing with the public, the lay-

men will desire and demand the services of the highly trained scientific physician, rather than those of the uneducated. This will be the more readily brought about when it is known that the qualifications for membership in this society are such that no higher endorsement of honor can come to any physician, no surer guaranty of his or her ability and honesty in the practice of medicine.

Never in our history were the prospects so brilliant as now, for the *progressive* and *constructive* advancement of the interest and influence of this society. We have progressed from vaccines to serums, then to glandular extracts and implantation of interstitial glands, and now the endocrins are under surveillance. We are evolving and reconstructing, but there are dangers ahead, and to be forewarned is forearmed. The time is ripe for an adaptation of medical practice to the evident requirements of modern science and economics, the formation of teams all over the country, each suited to the local requirements, and the faults which existed here and there in private practice would tend to disappear when the individual, himself, was no longer the only one to be considered.

The pride of every Kentucky doctor should be his state medical society, state medical journal, the board of health and the school of public health; today they are equal to the best, but tomorrow let them be better. They are our children, there is about them no "thine" or "mine," but they are OURS, and if they are not of the highest standard we should make them so.

In these suggestions I offer as to the many phases of reconstruction desired, made epigrammatically—I will have accomplished my chief desire if I have awakened and stimulated thought that leads to action. In the various departments of our profession there are too many unthinking cogs as well as in the wheels of industry, who grind their lives away without initiative, and whose hearts do not pulsate with the joy of their work, whose chief thought is quantity and cash and remuneration.

To the average layman a surgical operation possesses a heroic appeal and fees are more liberal and willingly paid than for the more quiet methods of diagnostic or therapeutic procedure, yet the latter require the most skillful technique, and in their interpretation call for the exercise of the finest judgment, *decisions*, in fact, upon which hang life and death, or determine surgical operation. The public is greatly in need of enlightenment upon what constitutes the proper valuation of services, whether laboratory, medical or surgical. The layman needs to be

*President's address American Laryngological Society, Atlantic City, June, 1921.

taught that the general practitioner who carries him safely through a typhoid fever or pneumonia with their perilous risks, has performed as large a service as the surgeon who does an appendectomy or mastoidectomy.

The danger of specialism is the development of a hypertrophic mentality along special lines, but atrophy of spiritual and moral sense for the sacredness of the human body and human life. Too often the goal sought is ambition; a new method, a record of operations, or volume of business, rather than service as a physician ministering to the strength, comfort and happiness of mankind in the healing or alleviation of disease. The surgeon should be a physician who operates, (Seng), and the foundation or requirements for surgery or any special practice should be that of the general practitioner or internist. Let every surgeon or specialist get out of the rut where he sees only the special part or thing, and look upon the MAN, the pulsating, reacting, thinking MAN with a HUMAN SOUL.

Some problems increased since the war:

1. Shortage of matriculates in medical schools.
2. Shortage of graduate and pupil nurses.
3. Shortage of physicians in rural districts.
4. Trachoma problem. (State problem.)

As long as a portion of our state has a national and international record of being the great hot beds of trachoma, and one of the departments of our federal government has to be called upon to assist us in checking its ravages, and as long as the specific factor of its etiology is unknown, the latter being a reproach to ophthalmology, we should increasingly intensify and multiply our efforts not only to eradicate the disease, but to isolate and make known its cause. This is one of our greatest and most important problems; the blinded sufferers are our fellow citizens, and their disease and suffering is a menace to our people. These facts should appeal with pathos and eloquence to the medical men and philanthropists as well as to the governor, senators and legislators of our state. I emphasize with earnestness this state problem because of the apparent indifference of many and because of the ignorance of real conditions to the necessity of doing more than is now being done for the solution. Our problems will be solved rapidly, surely and satisfactorily when we determinedly put forth a concerted and concentrated effort, and all of the help that we desire will be given when an educated and enlightened public is aroused to its needs.

Through the educational department of our state board of health, the public, everybody and everywhere are being taught that health and efficiency are a financial, social and moral asset, and disease and inefficiency a liability.

After inquiry and investigation in many states as to the work of their state boards of health and their multiple departments, and comparing the work done and the good accomplished, I am convinced that no state board of health is doing better work, more of it, and rendering more help to the profession and the people, than the state board of health of our own "Kentucky Home," and a visit and investigation of their work and methods, on your part, will also convince you that this statement is not exaggerated.

The majority of graduate physicians and graduate nurses are seeking larger comforts, larger opportunities, and more alluring attractions amid the bright lights and excitement of the big cities, and if the health and lives of our rural population are to be safeguarded, something constructive must be done to remedy this increasingly serious condition. If we are influenced by the pessimistic wail of some, it indicates that as a profession we are a diminishing class and legislators and public are reaping what they have sown.

If there is truth in this alarm the fault is not with the lawmakers and the people, but with us. Not for a moment do we admit that our influence and prestige is impaired; our authority flouted; our value to society challenged; our rights scorned to emoluments commensurate with the character of the services rendered. "Rome was not built in a day," neither will these problems be solved in an hour, but they will be solved according to the high and ethical standard characteristic of the medical profession.

The hindrances to our progress, indifference, selfishness and jealousy are destructive of all intellectual and moral earnestness. The adaphorous attitude or intellectual senility, that grabs so many doctors, lawyers and preachers is a disease afflicting the successful man who wants to *rest* on his laurels, burn candles to himself and wear the gown of scholasticism the remainder of his life. He gives little of his time to community interests, becomes self centered and selfish, is critical of others, and is apt to be carried by the ship of state as ballast. He does not attend his medical society meetings, reads comparatively little, becomes a medical kicker and a hold-back generally. Ours is the privilege and duty to keep the science and art of medicine in the field of human interest

and its practitioners as interesting humans. Let the cults rage if they must, but see to it that they keep out of the way of our work, which is a proved necessity and is solidly constructive.

Whatever of real regard the public has for medical men is not so much due to their abilities as technicians, but to the fact that they are an unselfish group of solid citizens that fit in unusually well to public and private need. We are gaining power, influence and position in the modern scheme of things, and there never was a time in the history of the world when medicine in all its many out-reaches took as prominent a place as it takes today; and the individual physician who measures up to the high standard of his calling is a more looked-up-to man in his community than ever before, but caste and materialism must be subservient to altruism and individualism, whose key-stone is the human being and its needs.

The need of the hour is men and women with a "live wire mind." The large majority of us today are of the cog and ball-bearing type of mind and specialization is begun so early that the foundations of knowledge and philosophical thinking are very narrow. The question of the moment to American education is whether our schools are developing the greatest number of observers possible, or whether the ordinary student is constrained to tread the beaten paths, with never a look to right or left, and never an impulse to inquire into the mysteries that lie near by. Too many are looking but not seeing. The man of the bush, who first used ash or hickory for his ax handle was a greater observer than the college man who thought cork came from Ireland. A man with an inquiring mind is what Edison calls a "live wire," interesting and interested, but in no way does this interfere with his being a specialized technical expert in any line in which he may be engaged. It was mind exercise that enabled the Greeks to initiate in physics, geometry, literature and art the foundations on which we build today. Who would have supposed that the study of the anatomy of the mosquito would reveal the true source of malarial fever, and that by this knowledge vast areas of the earth would be reclaimed for habitation?

At the present time we are confronted with a special problem to meet in the falling prices in various lines. Few are considering the situation from a business standpoint or have actually or accurately determined the cost of carrying on professional work in any particular locality, yet there has never been a better time to get to the bottom of the whole unsatisfactory subject of proper remuneration to the medical man than the present.

While the whole world is undergoing reconstruction, it behooves us as efficient members thereof to get in line and eliminate one at least of the bug bears of our profession. We should keep an accurate account of all expenses incurred in connection with our work and every medical man should know just what it is costing him to conduct his work. The laborer is worthy of his hire, but in the readjustment to meet the changing conditions, let us be careful to meet the situation efficiently as all other lines are attempting to do, and as between cost and income, let us not revert to the altruistic indifference of the past, but endeavor to stand with the advance as worthy members of an indispensable profession.

The following editorial from one of our most widely read magazines is quoted with our thanks of appreciation and approval:

"Sometime back the trustees of a well known eastern hospital, named \$1,000 as the maximum fee that ought to be charged for any operation. The public at large immediately jumped to the conclusion that overcharging by doctors was common throughout the country and that all fashionable practitioners were being censured. Now nothing could be more untrue. The medical scamp, the quack, the selfish money seeker, has been well nigh driven from the ranks of the profession. Taken by and large, medicine is today the least commercialized, the most overworked, and the most underpaid of the essential skilled professions, excepting only teaching and the ministry.

Nor are they inclined to cavil at the rather common practice of "charging what the traffic will bear." Fees cannot be standardized, and there is ample ethical justification for charging Mr. Moneybags \$5,000 to yank out his appendix if thereby Dr. Soakum is given leisure to operate on a dozen tenement house children for nothing in the clinic.

Hands off the doctors, for they are not of the profiteer class. And even the big chargers never get their bills paid until the last, until the butcher, the baker and the garage man have got theirs."

The scientific progress of medicine in the last two decades has been so rapid and expansive that together with the evolution and revolution of social medicine and the world war it has been imperative that the individual adjust or succumb.

Medicine as a practice is coming by leaps and bounds within the classification of group, industrial or state. Those of us who were satisfied with methods of prebellum days must decide as to the band-wagon in which

we shall ride. We must join, sleep on by the wayside, or establish our independence.

The group system of study, development and practice is as old as Hyprocrates himself. Every proprietary teaching unit of the olden days was in point of fact group medicine. The small hospital staff or clinic has exemplified for years the idea of cooperative combined effort for scientific and general professional advancement. The more perfect and enthusiastic its organization the higher the ideals and accomplishments.

There are so many dangers in this rapidly changing system that will soon surround the medical profession with grave and difficult problems. Competition is keen. Unjust and hypercriticism are fashionable and the unkind, restless, nervous spirit of war is among the people.

Group surgery and group medicine with group hospital care are demands of the laity for service. Concentration of professional effort for efficient scientific diagnosis is welcomed. The demand of army training and medical education for examination, hospitalization and operation when necessary, have spread throughout our nation.*

This system will win or fail if guiding hands steer it safely from the shoals of commercialism and fee-splitting. If the efficiency and humanitarianism are not sacrificed by jealousy, greed, disloyalty, lack of harmony and cooperation, the group system is sure to win.

The advantages to the patient are self-evident. He realizes fully the necessity of laboratory, x-ray and dental examinations and hospital observation at a fair fee.

The doubting Thomases say that the group system adds the danger of machine diagnosis and repair shop methods.

It is the tremendous success of group organization in the war that has created its demand today. My judgment is, it has come to stay because it is logically correct as the method to reach and serve the profession and the public at a minimum of expense and energy with the maximum efficiency.

We must realize that the average modern patient is impatient, hypercritical unstable and changeable. The doctor of today is not his of tomorrow. The law of obligation, the mere matter of appointments at the office or for operation are more often broken, bills are more frequently returned with the postmaster's notation, "left no address." In many instances appreciation of professional service has diminished and the wise counsel of the experienced practitioner is turned aside for the fad of the drugless cults. The fashionable clique change their doctor for

one more fashionable. The fault is within ourselves.

Advantages of Group Practice: The advantages of group practice are, first, better diagnosis and more scientific work, cooperation, mutual interest, conservation of effort, quick service to the profession and public; the use of team work at all times, the division of labor; specialization along lines particularly interesting to the individual; the pleasure of working among the sick where more than one man is scientifically interested.

The success of the group is in relation to the ordinary attributes of industry, intelligence, harmony and a spirit of cooperation, all of which characteristics ultimately receive their full reward.

Possible Disadvantages of Group Practice: The personal equation is lost between the physician and patient; the machine and dispensary methods prevail unless carefully guarded. It is difficult to obtain a group of men who are temperamentally fitted to associate in harmonious endeavor. It is difficult to find practitioners who will always operate under the Golden Rule, but as this is difficult in almost any walk of life, it may not be considered as a disadvantage. It is difficult to obtain men who do not overestimate their personal value and who entertain sufficient broad and humanitarian views to handle patients properly.

We are told also that specialists are like the labor unions in that they force the public to employ four men to do one man's job, and there is some truth in the charge. We are warned further that if we go too far state medicine will step in and protect the general practitioner and even things up. If these things are true, I think the general practitioner is hard put to it, and group medicine seems to be about his last straw. If he becomes extinct the human element will largely drop out of medicine, but nature will not be denied long. Some new fad which openly or covertly supplies the longed for human element will arise to vex and perhaps unite us. But I think that the readjustment in this matter of the general practitioner is even now well under way. When I gave up the practice of general medicine something very definite went out of my life, namely, the intimate personal touch with the patient, and I feared I was becoming more and more an operating machine, but I have come to understand what is meant by the phrase, the laboratory eye is glassy and the operating hand is cold, as the changes have come about gradually.

Close observation, as the years go by, of medical men, convinces me that the real prac-

*Group Head Surgery—H. B. Shurly.

tioner of the science and art of medicine does not make a diagnosis and formulate conclusions from data on half a dozen or more typewritten slips, but by observation and experience the doctor learns to interpret the different data and prove or disprove them by what his own fingers feel, his own ears hear, and his own eyes see, aided by intuition, which has been well defined as "subconscious reassurance based on previous experience." Not for one moment do I believe that the day of individualism has passed, nor do I think it will ever pass.

When the "group" ceases to progress scientifically, ethically and individually, I will leave it. I must feel that I am progressing, developing in the greatest of all professions, and not a professional hanger-on, like a barnacle, living on results of the achievements of others. I aspire to qualify for fellowship and companionship with the leaders in the medical world by thinking my own thoughts, doing my own work, singing my own song, praying my own prayer, and to be appreciated more for achievements for mankind through my profession, than applause for some superficial spectacular service. Achievement still demands the same unchanging price of love, labor and sacrifice, and let us pay the price joyfully.

There need be no fear that the personal relationship between doctor and patient would lapse if the group is only large enough to cover the main branches of practice and each man *guards the personal relationship* of each patient who came to him originally.

These conclusions are not only voiced by many of the leading medical men in this country, but also in Europe as evidenced by the unanimous endorsement of the resolution of Sir Thomas Horder by the Royal Society of Medicine, three months ago. "the time is now ripe for the formation of group clinics in this country, and encouragement should be given them by the profession and by its governing bodies." (Royal Society Med. June 16, 1921.)

In conclusion, having occupied much of your time while I indulged in a *pot pourri* of suggestions on some phases of medical evolution and reconstruction, I fear that my efforts have been like the proverbial woman's kimona that covered much and touched little, but I assure you that my chief desire has been to arouse generous thought and fraternal fellowship.

The man who says this is not the time of opportunity does not know. There is always room at the top, but never so much as now, and big, brainy men of vision and high ability are in demand; men whose bodies and

souls are in their work, with ideals that lead to inspiration and inspiration that leads to aspiration.

Let us as a society wake up, especially those of us bred, born, reared, educated and graduated in Old Kentucky, or graduated and post-graduated by the Gamaliels of the Eastern Schools, none better anywhere than they; but if we have ceased to study or to progress save in experience, and our technique is unchanged since leaving the East, if we are rarely seen or heard of save in our own circumscribed professional and social circles, we are not living in our profession, but existing upon it. Having received much from our profession, it is ours to give much, for,

"That man may last, but never lives,
Who much receives and nothing gives."

There is a difference between real living and existing.

Besides an active interest in our own state society, I urge membership and cooperation with two other national societies, whose leaders, writers and governing bodies are of the rank and file, heart and soul of our profession. I refer to the Southern Medical Society and the American Medical Association. The journals published by these societies with that of our own state society are a safe library, to instruct, guide and interest us. If we read them regularly and thoughtfully we shall be kept in close contact with the entire medical world of thought and action. For nearly half a century I have been in close touch with medical men. I have known them in their little jealousies and envies, known them in success and failure, joy and sorrow, and no class of men more beautifully, accurately and generously portray the sentiment of the poet, Markham, when he says:

The crest and crowning of all good,
Life's final star is brotherhood
And, till it comes we men are slaves,
And travel downward to the crest of graves,
Blind creeds and Kings have had their day;
Our hope is in the aftermath,
Our hope is in heroic men,
Star lead—to build the world again,
To this event the ages ran,
So make way for Brotherhood—
Make way for man.

And nowhere beneath Heaven's canopy have I found truer, better men than in the medical profession in "Our Old Kentucky Home."

ORIGINAL ARTICLES.

PERFORATION OF UTERUS FROM
CURETTE: CASE REPORT.*

By L. WALLACE FRANK, Louisville.

The following case is reported and the patient exhibited because of the infrequency with which such instances are observed. The patient, F. N., aged thirty-two years, was admitted to the Louisville City Hospital April 15th, 1921, with the following history: On April 9th while at home in bed she stated that "the bag of waters broke;" she was thought to be about four months pregnant. This was the first knowledge she had of anything wrong. She remained in bed and soon developed chills which continued until her doctor gave her some medicine. The following morning she was able to be out of bed, but about noon she was compelled to return to bed on account of the severity of the chills. She said the doctor remained with her for several hours.

Monday morning, April 11th, a curettment was performed, and on April 12th and 15th the uterus was irrigated. The patient suffered severe pain after the last irrigation and another doctor was called who immediately sent her to the hospital. On admission, based on the foregoing history, a miscarriage with retained infected secundines was suspected. She complained of no pain in the abdomen, there was no rigidity of the abdominal muscles, temperature 98 degrees F., pulse 120; there was slight distension; no masses were palpable. We sat her up in bed and gave her a douche on Saturday morning.

About ten o'clock Saturday forenoon I examined her and found marked abdominal distension and a mass presenting in the vagina which looked very much like sloughing membrane. I took her to the dressing room and started to remove what I thought was membrane and after pulling on it once or twice she complained of great abdominal pain. All that could be seen was this grayish sloughing mass. After pulling on it a little more I found that I was pulling on a piece of the large intestine. Further investigation revealed that this was about six inches in length and had descended into the vagina through the cervix, and in the intestine was a large perforation.

The patient was then taken to the operating room and a mid-line incision made, because it was not known just which part of the colon was

involved, nor the location of the perforation in the uterus. The intestine proximal to the sigmoid was found enormously distended the obstruction evidently being almost complete. Investigation disclosed a perforation extending through the left broad ligament into the cervix and through which projected a loop of sigmoid. The mid-line incision was then closed and a portion of the sigmoid was brought through a stab wound in the left flank and a tube sutured into the intestine.

The patient by that time was in a critical condition, her pulse was between 120 and 140 while she was on the operating table, and she was scarcely breathing. I did not feel justified in doing any more radical surgery at that time. None of us expected the patient to survive many hours, but I am glad to say she has improved remarkably. Her temperature is now about 100 degrees F., pulse 120.

I thought it was a very unusual type of case, and for that reason had the patient brought before you for examination so you could see how deceptive the conditions were. The sigmoid which still protrudes through the vagina, looks very much like membrane. I would like to have put this back into the abdominal cavity at the time of the operation, but on account of the large perforation in the sigmoid this could not be done without soiling the whole cavity, and, as the patient was practically moribund at the time, I did not feel like doing anything which required further surgery.

I wanted to show this case because it is unusual. Of course a subsequent operation will be necessary. I have heard of the uterus being perforated by the curette, and understand such an accident has happened to some of the most prominent operators, but have never seen a case like this before. This woman's uterus is now about the size of a three months' pregnancy. It is our opinion that an hysterectomy will be necessary, but the operation will have to be delayed until the patient is in better physical condition than at present.

The greatest problem in the future handling of this case will be in getting the sigmoid back into the abdominal cavity. At the time of the operation I did not feel justified in doing anything except to relieve the obstruction. There was so much distension proximal to the sigmoid that I had to insert a needle into the small intestine to permit the escape of gas. This was necessary before the intestine could be returned to the cavity.

DISCUSSION

O. E. Bloch: The case reported by Dr Frank is most unusual. I regret that he cannot tell us the character of the instrument that was used

*Clinical report with exhibition of patient before the Jefferson County Medical Society.

in making the curettment. I feel sure that it was one of the old-fashioned augur-shaped instruments which did the damage. I think such curettes should be absolutely discarded from our armamentarium.

Irvin Abell: I have had an experience similar to that related by Dr. Frank, the uterine perforation in that case having been due to the use of a so-called augur curette. I had never seen such an instrument, but on examining one later I could readily understand how it could be pushed through the uterine wall and cause a perforation. In the case I saw sixteen inches of the small intestine protruded into the vagina and had become gangrenous, necessitating resection.

I hope Dr. Frank will report to the society the final result in the case he has presented.

E. D. Smith: When I was an interne in one of the large hospitals a general practitioner brought a patient to the hospital for curettment and performed the operation himself. In doing this he perforated the uterus. During the operation something appeared in the vagina which he thought was the umbilical cord, but after drawing it through the vulva he recognized the intestine—but not until after tearing the intestine away from the mesentery and rupturing it. He became very much alarmed and tried to return the intestine to the uterus. A surgeon was called who opened the abdomen and resected the intestine. The patient recovered. The instrument used in that case was an ordinary sharp curette.

Even the most cautious surgeon may puncture a soft, flexed uterus; but pulling down and tearing the intestine is certainly inexcusable.

L. W. Frank (closing): The mass which protruded into the vagina looked exactly like membrane. I was much surprised to find that it was the large intestine. It is the small intestine which usually finds its way into the vagina following uterine perforation. Had the patient been seen immediately following the curettage it would have been a much easier case to handle.

I shall be glad to report to the society the final result in this case.

Treatment of Putrid Bronchitis with Neo-Arsphenamin.—K. Schroeder treated several cases of chronic bronchitis by the Karell method. In one of these, after five months' illness, intravenous injections of neo-arsphenamin were given in increasing doses (15, 30, 45 cc. at intervals of seven to sixteen days), marked improvement resulting; fever and expectoration ceased, and general health improved. There was no history of syphilis. Similar benefit was realized in a second case.

HIGH BLOOD PRESSURE.*

By GEO. W. PAYNE, Bardwell.

High blood pressure is a symptom and not a disease. Hence, the treatment of hypertension is like that of high temperature, is not really a question of reducing the vascular pressure at all, but of remedying the pathological condition, or conditions, which underlies the high pressure as infections underlies high temperature.

It is easy to see that the maintenance of the circulation is not a question of the degree of tension in any part of the circulatory system, but of a proper relation in the tension between the pressure in the arteries, where the blood is stored, and the points at which it is needed.

There are practically but two general pathologic conditions which necessitate, and therefore bring about, an increase in arterial tension, in order to maintain this normal relation between the arteries where the blood is stored and the points at which the blood is needed, namely, a change in the physical character of the arterial walls themselves, as in arterio sclerosis, and a disturbance of that portion of the vascular system where normally the equalization of the arterio-venous pressure is automatically regulated, renal vessels as in nephritis.

These two conditions, arterio sclerosis and nephritis, are so interdependent and merged into each other that it is almost clinically impossible to make a distinction between them.

Arterio sclerosis frequently leads to nephritis and *vice versa*, and perhaps the two develop together. In either case a rise in blood pressure is a normal effort of the body to compensate for the difficulty, and so long as compensation is maintained, it is not necessary to reduce the blood pressure even though it is high, for this may be your patient's normal condition.

Before we undertake to treat a case of high blood pressure we should ascertain the cause, or causes, if possible, and there are a great many things that will cause a hypertension, namely; overwork, overeating, excessive use of alcohol, tobacco, inactivity of the kidneys, whereby toxic substances are retained in the blood, worry, etc.

Generally speaking, we are justified in beginning the treatment of hypertension where there is a systolic pressure of 190 M. M. or over and especially so if we are not familiar with the case and do not know what his normal pressure is. Under these conditions we should

*Read before the Carlisle County Medical Society.

put the patient to bed. Put him on a proper diet, and give attention to the intestinal tract. It is advisable in all cases of high blood pressure, even though the patient is up and going, to have them lie down for an hour during the middle of the day. Restrict the diet in all cases of high blood pressure, the quantity is more important than the kind of food as a rule.

Eat spiceless food, lessen or perhaps better still, leave off meats, increase vegetable diet, lessen salt, leave off alcohol and lessen the fluid intake if dropsy is present.

In cases of obesity where the tension is high, fats and carbohydrates must be restricted, especially cereals, bread and potatoes. Massage is good in these cases.

The gastro-intestinal tract should be kept in a good condition, bowels freely open so there will be no intestinal toxemia. If these measures do not produce results then we will have to resort to drugs or other means, yet we must not use any very active means to reduce the pressure, remembering that it may be necessary for the pressure to be high for the maintenance of an adequate supply of blood to the diseased organs and that too rapid a reduction in blood pressure may produce a suppression of urine or an edema of the lungs.

In cases where dropsy is present, it is necessary to use cathartics, and of these perhaps compound jalap powder is the best, alternating with calomel, blue mass, or salts.

The remedies which lower blood pressure may be divided into three classes. Cardiac depressants, arterial dilators, and measures for decreasing the volume of blood.

In the first group of cardiac depressants we have aconite in the form of the tincture of aconite; I use the tincture quite a bit in ten drop doses three times a day.

Veratrum is also classed under this head, and the tincture is the best preparation, it slows a rapid heart or quiets an over-acting one.

Under the arterial dilators we have the nitrites, amyl nitrite, sodium nitrite, and nitroglycerin; of these I prefer the nitrite of soda in one grain doses.

The effects of nitrites upon the circulation are, depression of the arterial muscles, resulting in dilatation of the arteries, increased rate of the heart beat, and perhaps increased tone and strength of the heart.

Lastly, blood letting is the means by which we decrease the volume of blood. This is perhaps not practiced enough at the present time.

Hydrotherapy is another very important therapeutic measure properly handled.

If hypertension is due to arteriosclerosis, the iodides may be of some value and especially so if you get a history of syphilis.

If due to nephritis, treat the nephritis and diet here is the main reliance and milk the best food.

I remember one patient that my Faught pocket case would not register, the systolic pressure must have been between 350 and 400 M. M.

In conclusion let me say, regulate your patients' habits, limit his diet, and give him proper exercise, regulate his mental activity, have him lie down at least one hour in the middle of the day, get them away from their business worries at least twice a year, see him at least once a month so that you can keep tag on his condition—in other words, teach your patient how to live and if he will carry out your instructions you will prolong his life.

SOME FACTS ON THE ANNUAL DEATH RATE OF LOGAN COUNTY AND RUSSELLVILLE.*

By WALTER BYRNE, SR., Russellville.

Good business men often take stock. I wonder how many of us doctors do. Have you, and you, and you ever compared your doings with the doings of your medical brethren of ten years ago, of twenty years ago, of thirty years ago? Are you acquainted with the work done in the years of 1880 to 1921 along the statistical line? How many more deaths are credited to your advanced skill than followed the crude skill of our Hippocratic brethren of the latter part of the nineteenth century. Have you availed yourself of the many opportunities of a complete knowledge of diseases, that the Science of Medicine and the Art of Practice offers to us all in this good day of the year 1921? If you have, surely our death rate ought to be diminishing. Is our death rate diminishing here in Logan county or in the town of Russellville? Let us just for a moment run over the whole country and gather some statistics. Unfortunately our registration area twenty years ago, embraced but a small territory, and to-day it does not cover all of our great country. So our statistics will be only approximately correct, but sufficient to show us which way we are drifting. In 1900 17.6 persons died out of every 1000. In 1901 16.5 persons died out of every 1000. In 1902 15.9. In 1903 16.0. In 1904 16.5. In 1905 16.0. In 1906 15.7. In 1907 16.0. In 1908 14.8. In 1909 14.4. In 1910

*Read before the Logan County Medical Society.

15.0. In 1911 14.2. In 1912 13.9. In 1913 14. In 1914 13.6. In 1915 13.5. In 1916 14.0. In 1917 14.2. In 1918 17.9. The statistics of 1919 I have not but we have the reports for nineteen years. We start out with a mortality of 17.7 per one thousand and we ended up with a mortality of 17.9, but we must remember we had the "flue" epidemic in 1918 and that helped swell our mortality from 14.2 in 1917 to 17.9 in 1918.

But listen, the death rate per one thousand population in the United States in 1917 was 14.2, in England, Scotland and Wales (civil population only) 14.4, Ireland 16.8, Spain 22.5, Sweden 13.5, Australia 9.8, New Zealand 9.6. Now do you believe, and is it reasonable to think, that the people of the United States, England, Scotland and Wales, Ireland, Spain and Sweden had less medical men to look after their ills than the people of Australia and New Zealand. Do you believe the doctors in Australia and New Zealand were better equipped to combat disease? Or do you think it was climate out in these new countries and happened just that way? Remember, if you please, while Australia and New Zealand are new countries they have made wonderful strides in civilization and new blood is keen to adopt and try advances in science and arts. Or do you think, like some of our lay brethren, that a dearth of doctors is conducive to the health and welfare of the populace?

Here are some figures that may interest you. The whole number of deaths from all causes in the United States in the year 1918 approximated 1,500,000, this is 15.0 per one thousand persons. Influenza approximately claimed 250,000, pneumonia 180,000. Other diseases of the respiratory system (tuberculosis excepted), 80,000. Tuberculosis 125,000. Cancer and other malignant tumors 66,000. Acute nephritis and Bright's disease 80,000. Congenital debility and malformations 65,000. Organic diseases of the heart 125,000. Cerebral hemorrhage and softening 67,000.

You have been hearing of late, much talk of the rapid increase of cancer and what inroads it was making among our matrons and maids, 26,000 male and 40,000 female deaths in 1918. But when you look over this list you draw a long breath and emit a sigh of relief for it's not as bad as it might be. Pneumonia, like the poor, we have with us always, nearly trebles the death rate by cancer. Other diseases of the respiratory system (tuberculosis excepted), kills more people than cancer. Organic diseases of the heart, more than doubles it. Cerebral hemorrhage and softening goes it one thousand better. Acute nephritis and Bright's disease 80,000. Gastro-intestinal

troubles, including appendicitis, hernia and cirrhosis of the liver aggregate some 85,000 against cancer's 66,000. Influenza's toll was 250,000, but really, if the diseases closely connected with it, as pneumonia and other diseases of the respiratory system are included, influenza's total is more than 500,000; and I do not think the deaths in military camps were included. Neither were any deaths in military camps included "in the whole number of deaths from all causes in the United States." If I am correct about this, the death rate per one thousand population will be nearer 16.8 than 15.0.

Now let us see what Old Kentucky is doing for the lowering of the death rate. Our State Board of Health has labored conscientiously and faithfully and patiently along this line. And I say it without fear of truthful contradiction, that in none of the states of the Union have the boards of health given a more efficient service to the people than has the Kentucky Board of Health. The population in 1919 was 2,408,547 and the deaths from all causes were 30,900; so our death rate per one thousand is 12.8. For the year 1918 our total deaths were 40,579. Estimating the population as for 1919, our death rate in 1918 per thousand was 16.6. This included the deaths in the military camps in our state. We had 13,630 deaths from influenza and pneumonia all forms, in the year 1918. We had about half this number of deaths from influenza and pneumonia in 1919.

Now brethren of the guild of Aesculapius, we are going to get down to business right here at home and as our friends, the English, say. What. The population of Logan county is about 25,000 in round numbers. Now from 1911 to 1915, inclusive, the five years death rate per one thousand population was 13.0. In 1916 it was 11.4. In 1917 it was 12.5. In 1918 it was 14.4. In 1919 it was 10.1. For four years from 1916 to 1919, inclusive, the death rate per one thousand was 12.1. A considerable gain for the better, and, too, when we passed through an epidemic of influenza in the year 1918. So we pat ourselves and feel monstrous good over this showing, what? But hold-up, you "followers of Hippocrates", and listen to some more statistics before you begin your shouting. Compiled from the undertakers (Mr. W. L. Proctor's) books I find the following information.

In the month of September there died within the corporate limits of Russellville, five. In October one. In November, seven. In December, seven. In January, 1921, seven, and in February, six. Thirty-three deaths in six months. An annual death rate of 22 per one thousand population. Now of this number

twenty-three are white and ten colored. Now we have about, in round numbers, eight hundred colored people in Russellville. So you see we have an annual death rate of 25.0 per one thousand among the colored population. We have about, in round numbers, twenty-two hundred white people in Russellville; so the annual death rate per one thousand is 20.8 among the white population. If we count from January 1st, 1920, to December 31st, 1920, inclusive, we have to figure from the best information obtainable, as Mr. House's (who did business as undertaker in Russellville until the middle of the summer) books are not accessible. But from the best information obtainable we had fifty-seven deaths in Russellville from January 1st, 1920, to December 31st, 1920, inclusive. We have then an annual death rate of 19.0 per one thousand. The annual death rate per one thousand white population is 16.8; the annual death rate per one thousand colored population is 25.0. Now gentlemen what do you think of this showing. I have endeavored to sift this down, because I am very much interested in the subject, and I admit my pride is touched too, and I think if any favors would have been indulged it would have been against these figures. Does it rile you to know that our county confreres have the inside track on you, my hearties. Logan county with an annual death rate of 12.2 per one thousand and Russellville with an annual death rate of 19 or 22 which ever horn of the dilemma you prefer to take. Stir yourselves.

If we deduct the number of deaths occurring in Russellville from the whole number of deaths in Logan county, we find that Logan county's death rate is only 8.5 per one thousand population, while the death rate in Russellville for the same year is 19. per one thousand population. Some difference, is it not? I had no statistics for Russellville for the year 1919 and used the statistics of the year 1920. Using the statistics on death rate of the city of Russellville for the year 1920 for number of deaths each year since 1911 we have a death rate for Logan county for the years of 1911 to 1915, inclusive, 11.9 per one thousand population, or a death rate of 13.1 if Russellville's deaths are included in with the rest of the county deaths for these five years.

The death rate for 1916 for whole county, 11.4.

The death rate for 1916, Russellville left out, 9.9.

The death rate for 1917 for whole county, 12.5.

The death rate for 1917, Russellville left out, 10.0.

The death rate for 1918 for whole county, 14.4.

The death rate for 1918, Russellville left out, 12.0.

The death rate for 1919 for whole county, 10.1.

The death rate for 1919, Russellville left out, 8.5.

For five years from 1915 to 1919, inclusive, the death rate for the whole county was 12.1. With Russellville left out the death rate for the same period was 10.1.

Gentlemen I hope you will cogitate, and cogitate some more, and then again some more, and from all this cogitation may the betterment of our folks come on apace.

In 1916 two hundred and eighty-five (285) died in Logan count.

In 1917 three hundred and twelve (312) died in Logan county.

In 1918 three hundred and fifty-nine (359) died in Logan county.

In 1919 two hundred and fifty-four (254) died in Logan county.

These figures are from the "Bulletin" of the State Board of Health of Kentucky, May 1920.

RHEUMATISM.*

By T. J. MARSHALL, Bardwell.

I once heard a very prominent physician, a close student say that the subject of rheumatism would have to be rewritten, and I wonder if the beginning of the rewriting has not begun, when we read the writings of our foremost investigators and observers.

We hear a great deal more of focal infections now than we did a few years ago, the teeth, tonsils and sinuses are very much in the limelight as being headquarters for such diseases as the one which we have under discussion.

It has been said that 80 per cent of all illness has its cause above the collar bone.

The word rheumatism has covered, and still does to some extent, a multitude of sins, of ignorance; it has probably been surpassed by only one other, namely, malaria.

When a patient complains of pains, (aching, darting, dull, stabbing or what kind) we can not be satisfied to say he has rheumatism, and load him up on salicylic acid, but it is absolutely necessary to find or eliminate a local focus of infection. If found, corrected. If not found by careful, painstaking examination, both clinical and laboratory, we can probably do no better than to treat the con-

*Read before the Carlisle County Medical Society.

dition as we did ten or fifteen years ago, but can promise very little as to a cure.

I have had many people to ask me if I could cure rheumatism, or say "There is no cure for rheumatism is there?" or, "If a doctor could find a cure for rheumatism he would get rich quick."

When we look over a stock of patent medicines in a drug store or read the advertisements in the papers, we are led to believe, if we believe all that is claimed in the advertisements, that there must be already many real cures, or still there are many laymen we meet on the streets who can tell us of as many different cures for rheumatism: Yet, look at the multitude of sufferers we find who say they have rheumatism and can find no cure. The laity want to swallow a pill or take some medicine, for their ailment, expecting said medicine to rid their systems of the specific malady. They, the laity, have been taught by the doctors that every pain and ache are rheumatic, except the pain and aching in the lumbar region, so-called lumbago or a myalgia, this they call kidney trouble and it is hard to convince them otherwise.

It is a difficult task sometimes to convince these ambulatory sufferers, with lame back, or legs or crippled arms or hands, etc., that by finding and correcting a local focus of infection, such as extracting a tooth or teeth, removing diseased tonsils, draining infected sinuses, or surgery of the infected gall bladder, etc., might prove a cure in their own undivided cases. How many times have you told a patient that this or that tooth might be causing the pain in his leg, and have had him grin at you, as much as to say, "I'll go from here to a rheumatism doctor." I do not mean by any means that all patients view us in this light, and the ones who think we are foolish to say that a bad tooth or a diseased tonsil causes pain in the foot, have been taught what they believe by doctors. The present generation of doctors are teaching their patients that these local foci of infections do cause what we sometimes term rheumatism and are ready to submit to the cleaning up of such infections hoping to find relief from their rheumatism.

Report of Case 1. Mr. F., age 63, consulted me May, 1920. For the last several years had suffered more or less from rheumatism and the preceding winter was confined to the house most of the time. He had taken everything he had heard of for relief and cure of rheumatism, used all kinds of local applications, had been treated by doctors along the usual routine, salicylate, etc., so there was nothing left for me to give him. I looked in his throat, and at his teeth, both throat and teeth looked alright. I asked him if his teeth

ever got sore or one seemed longer than the others, he said that was so, so I explained to him how pus about the root of a tooth might cause rheumatism and advised him to consult a dentist. The dentist made an X-ray of his mouth and found several infected teeth, which were extracted and in a short time with the aid of elimination and tonic treatment he was clear of his rheumatism and so far as I know he has remained so.

Case 2. Mr. P., age about 50, large man, consulted me in the fall of 1920. He had been a sufferer of rheumatism at intervals for several years. His throat looked alright, but he had a bad case of pyorrhea alveolaris. I advised him to consult a dentist, but it was not convenient at that time. I treated him with salines, iodides and salicylates and for several days he might be free from pain, but always sooner or later it would return, all symptoms of acute articular rheumatism, tender, sore inflamed, swollen joints, some times not more than one joint would be involved, at other times there would be three or four or more. Right here is an interesting instance in his case. One day while free from any rheumatic pain or symptom, he fell from his hay loft, striking on his right arm, immediately the right elbow began paining him excruciatingly, and began swelling. He came to my office the next day. The arm was in a sling, the elbow was almost twice the size of its mate, red, exceedingly tender and painful on the least motion. It was impossible to feel the bony parts that go to make up the elbow joint, partly on account of the pain elicited on touching the affected parts and partly on account of the swelling. I did not know whether he had a fracture about the joint or a dislocation or what. I called in consultation and we debated as to administering an anesthetic and trying to arrive at a diagnosis, or sending the patient for an X-ray examination. I'll say we also thought of his rheumatism. The patient decided that we wait a few days before we did any thing rash, this we did but pushed up the salicylates, with complete recovery of this joint in three or four days. However, he continued to be a rheumatic until he visited a dentist and had all his teeth extracted. He now has a new clean set of teeth and no rheumatism.

The point I am trying to make is locate the cause, and remove the infection causing the symptoms, then if we have done this, under proper care, elimination and diet we can promise the patient a cure.

Case 3. Several years ago a young man about 24 years of age consulted me, stating that he had been treated for the last few years by several physicians, in another county, for

rheumatism. On examination I found that this patient had flat foot. He got some arch supporters and as long as he would use them he had no pains in his back and leg muscles. All pains are not rheumatism.

In cases of rheumatism whether muscular or articular there is a focus of infection, as an acute attack of arthritis is nearly always preceded by tonsilitis, or some other point of focal infection.

Case 4. Mr. H., 39 years, March 1921 was taken rather suddenly with chill, fever, and pain and swelling in hands and elbow joints. This case ran a course of regular acute articular rheumatism, and made a slow recovery, and even now, although making a crop, he still has joint and muscular pains. This case of rheumatism was preceded a few days by an attack of tonsilitis. There is no doubt in my mind but that this patient's tonsils are the local focus of infection now, and not only caused the acute symptoms but are causing the pains that he has at present and I don't expect him to be well until his tonsils are removed.

While these chronic rheumatics, may continue to suffer, yet the complications and sequelae make rheumatism really dangerous to the life of the patient, of which the heart itself receives the brunt, if we have an acute endocarditis coming up during the attack of acute rheumatism, while the patient is in the bed, we are not apt to overlook it, but in cases going about, without fever, but with muscular pains or may be a finger stiff and swollen, or in children "growing pains," we can have a healthy heart that gradually becomes a diseased heart and no one know anything about it unless the lesion is found by a doctor accidentally, as it were, or the patient begins noticing symptoms, such as shortness of breath, edema of feet or face, for which he consults his physician, when the true condition is brought to light for the first time. A diseased heart may be the result of a diseased tonsil, or tooth or the gums or the sinuses, etc. without ever causing rheumatic pains.

Anemia, comes sometimes early in acute rheumatism and lasts for a long time after the patient is about.

Age, season and heredity seem to play a small part in the etiology.

Rheumatism may be mistaken for tuberculosis of the joint or *vice versa*, injuries about joints are to be differentiated from rheumatism, as also are scurvy and pyemia. It may be necessary to resort to the X-ray in some instances to tell whether you have a tubercular, or a joint injury (dislocation or fracture) or rheumatism. Gonorrheal arthritis may be eliminated by the history, character of pain, etc., and if still in doubt aspiration of

the affected joint will result in the recovery of fluid in which gonococci will be found.

Treatment. Prophylaxis: All diseased tonsils removed, infected nasal sinuses drained and rendered non-infectious, diseased teeth remedied, all cases of pyorrhea cured, infected gall bladders drained or removed, diseased appendices removed, etc., and we will have done more for suffering humanity than it is possible for me to tell you here.

Treatment of an acute attack of articular arthritis: Complete rest in bed, alimentary elimination, opiates if required, milk diet, local applications over affected joints may be grateful, and salicylic acid in some form. I have not used phylacogen. Watch the patient's heart so that appropriate treatment can be instituted. Anemia is to be combated by the judicious use of iron, arsenic, etc., and should be continued during convalescence. I believe that there is a cure for most cases of rheumatism, but each case is a law unto itself, and the same treatment will not apply to all. The cures are not so startling as the patient looks for, for when he says if a man knew what would cure rheumatism he would get rich quick, he means that if a drug were found that by taking of a few doses would rid the sufferer of his rheumatism, the discoverer would get rich.

The laity believe that drugs act mysteriously and that there is no mystery in a common sense application of cause to effect. Therefore if we can get the patient to submit to the necessary examinations and operations and he is cured the mystery clears up and the cause of the disease and the cure thereof becomes so reasonable that the doctor fails to get rich quick.

Lowering Diphtheria Mortality.—The vital statistics concerning diphtheria analyzed by Hull show that we have reached practically a dead level. Among the registration states Pennsylvania has next to the highest mortality rate per 100,000 population. In combating this situation the following suggestions are made: Early and correct diagnosis with the rational use of laboratory methods, which includes the application of the Schick test more extensively and the immunization of the susceptibles with the toxin-antitoxin mixture. Prompt reporting and isolation of suspects. The use of antitoxin treatment to immunize those exposed. Study of the problem of diphtheria carriers and their isolation until safe to release. The introduction of proper instructions to school teachers and pupils in the prevention of communicable diseases.

INFECTED TONSILS—THEIR RELATION TO SYSTEMIC DISEASES.*

By E. STANLEY McILWAIN, Cynthiana.

From the title of this paper it will be at once apparent to all that we are to deal with the very important subject of focal infections, and whatever we may have to say upon this subject is in a great measure true of all foci of infections, especially those situated in or near the cavities of the nose and throat.

Although systemic or general disease due to local infection is a conception almost as old as medical knowledge, it is only in the last dozen years that a wider and broader knowledge of the subject has been brought about, by greater learning in bacteriology, in modes of infection and by co-operative laboratory and clinical research.

Primary foci of infection may be located anywhere within the body, but the tonsils, situated as they are in the oral cavity, where they are exposed to micro-organisms of almost every variety, and on account of their histological structure—being composed chiefly of lymphoid tissue—are the most frequent sites of infection.

The faucial tonsils are situated on either side of the oro-pharynx and are bounded in front and behind by the faucial pillars and externally by a fibrous capsule; the inner surface being covered with stratified epithelium. They each contain from eight to sixteen crypts, or lacunae, branching out from their face and extending within the tonsil substance almost to their capsules; these lacunae or crypts contain broken-down cells and debris, and oftentimes lodge particles of food and other matter, which if retained, readily decompose and become fetid and laden with bacteria. These fetid masses are more frequently found in the submerged, or buried type of tonsil, the character of which is likely to escape notice. Thus it is evident on account of the situation and structure of the tonsil, after it once becomes infected, that it is no easy task for it to rid itself of the invading organisms, the crypts due to the inflammatory process or to the lodgment of food particles, soon become closed and the surrounding tonsillar tissue inflamed; the glands at the-angle of the jaw then become enlarged forming secondary foci of infection; and from these and the tonsils are sent out through the blood and lymphatic systems either the micro-organisms, themselves, or the toxins and products of inflammation

that produce the various morbid conditions in remote parts of the body.

Systemic infection from the primary focus of infection is, in the majority of cases, hematogenous; that is the bacteria are being carried away from their original site by the blood-stream; often to the smallest terminal blood-vessel. If these micro-organisms are heavily endowed with virulency, if having a specific, elective pathogenic affinity for the tissue in which they lodge and if in sufficient numbers, characteristic reactions are produced, with the sequential train of morbid anatomical lesions. These infectious micro-organisms may also pass from the focus to other tissues through the lymph channels and lymph-nodes; this occurring from the primary focus co-incidentally with the hematogenous systemic infection. When the primary focus is in the tonsil or about the head, particularly is it true that we will find a secondary infection of the lymph nodes of the neck, and extending oftentimes to these mediastinal nodes. Of course, the tissue reaction occurring in any of these infected lymph-nodes varies in intensity with the virulency and character of the invading organisms; so a varying degree of inflammation results in proliferation of lymphoid cells with swelling and tenderness of the nodes. These nodes as secondary foci may continue as active deposits of supply of bacterial infection to other tissues, or if the invading bacteria of the nodes are pyogenic and virulent, a circumscribed abscess may result and this rupture into or cause thrombo-phlebitis, in an adjacent vessel with a resulting bacteremia. In some instances, however, the infection in the lymph node may be a protection, by holding the invading organisms in a tissue—environment which renders them latent and for the time being, harmless to the patient.

Systemic intoxication may further occur by toxic material formed by bio-chemical reaction excited by the micro-organisms upon the tissues and cellular exudate of the focus. These are spoken of as toxins or endotoxins. Two good examples of these are found in diphtheria and tetanus, in which the morbid tissue-reactions are caused by soluble toxins produced by the specific micro-organisms in a focal area.

As stated before, a focus of infection may be located anywhere in the body, but certain structures, for various reasons, are more frequently affected than others. An ideal site for a focus of infection, of almost any kind, is in a structure composed of lymphoid tissue and in one which contains recesses or pockets that do not drain freely; this, particularly, is true of the tonsil. In consideration

*Read before the Harrison County Medical Society.

of this fact and the many contributions to the literature, as well as the great amount of research work done, within the past few years, have proven conclusively that infection of the tonsils is the most frequent cause of such systemic conditions as the following: Infections arthritis, acute rheumatic fever, nephritis, endocarditis, myocarditis, osteomyelitis, appendicitis and many, many others too numerous to mention, together with a large group of nervous disorders, commonly classified as neurasthenias. The organisms found in the tonsils in such conditions are the usual pathogenic varieties such as the streptococcus viridans, streptococcus hemolyticus, staphylococcus albus, the pneumococcus, the tubercle bacillus, the colon bacillus, the bacteria pyocyanous and several varieties of gram-negative diplococci. In regard to a selective action that certain organisms have for certain organs or tissues it may be said that the streptococcus viridans shows especial affinity for the heart membranes and valves and the streptococcus hemolyticus for the joints and lymphoid structures.

It is not the purpose or intent of this paper to indict the tonsil as the offender and source of all the maladies in the realm of human ills, but when we consider the opinions of numerous writers and investigators of eminent renown, the consensus of opinion of whom, gives them first rank as foci of disease, we are, at least, compelled to admit that they are responsible for a large percentage of these systemic conditions. Scientific men working in various fields of medicine almost unanimously agree that in cases of systemic conditions caused by focal infections, that in by far the larger majority of cases the focus will be found in the tonsil or in what is known as Waldeyer's ring, i.e., teeth, gums, nasal accessory sinuses—middle ear, mastoid and lateral sinuses—or in fact all cavities communicating with the mouth, nose or naso-pharynx; however pus enclosed in any of these cavities for all clinical purposes, is one and the same problem.

The result of Cotton in eradicating foci of infection at the New Jersey State Hospital for the Insane from the inmates, is one of the brilliant chapters in the achievements of modern medicine. For a period of years previous to 1915 the average rate of discharge of patients from the hospital was 42 per cent; since that time he has searched for and eradicated foci of infection from the patients with the result that 87 per cent of these patients have been discharged cured, or so much improved that residence in a mad house was no longer necessary.

Rosenow, whose experimental work has done

so much to put the relationship of focal infections to systemic disease upon a scientific basis, has said: "In the light of our present knowledge the argument that infections in the mouth and throat are so common in individuals in apparent health does not minimize their importance. These or other foci are so common in patients suffering from arthritis, neuritis, appendicitis, ulcer of the stomach and cholecystitis, goitre, etc., and so rare in individuals who have had superb health for years, that their direct etiologic role can scarcely be questioned. Further, he says, "The most common location of the focus or source of infection, probably is in the tonsil or teeth. The focus of infection must be regarded not only as the place of entrance of the bacteria, but also the place where the organisms acquire the peculiar properties necessary to infect."

It is, too, an accepted fact that the etiologic factors in many secondary conditions, following a primary disease of a more or less trivial nature, are these foci harboring microorganisms, that are of themselves latent and harmless, for the time being, however, when the primary disease so weakens the patient's resistance or the bacteria take on increased activity, due to local tissue reactions, the patient becomes overwhelmed by the toxemia of the secondary invading organisms. Thus in acute respiratory and throat infections, streptococci spread from the tonsillar crypts to the adjacent mucous surfaces, descend into the bronchi and lungs and from there send out their toxins or enter the blood stream. However, on the other hand, if the disease is chronic, the diminution of the resisting power of the blood may admit the bacteria directly into the circulating blood-stream without any marked local changes. In many of the diseases of childhood, as measles, whooping cough, scarlet fever, etc., the secondary pneumonia that often follow are many times due to the organisms having been harbored in a diseased tonsil, for sometime previous to the contraction of the primary affection. Death in these cases is usually due to the secondary invader, rather than to the primary etiologic agent.

In view of the foregoing and what is known concerning concerning infections; and their modes of entrance into the body, and especially when systemic conditions are manifested, the etiology of which is more or less obscure, we should bear in mind the frequency in which these foci of infections occur and their relation to systemic disease, especially that of the infected tonsil, and not content ourselves until we have exhausted every method and measure at our command in the discovery

and removal of same. There should be more general and effective measures of prophylaxis established, with frequent inspection and examination of teeth, tonsils and adenoids, with a view of correcting the defects found, thus saving the patient, probably untold suffering and as an aid in the fight against preventable disease.

In the examination of the throat we must not content ourselves with a mere perfunctory glance into that cavity only taking notice of what symptoms present themselves upon the surface of the contained membranes, but the tongue should be pulled well down to expose the lower pole of the tonsil, the faucial pillars retracted and the tonsil compressed, in order to ascertain what the crypts may contain. In some cases cultures should be made from the material obtained from these, as they are a valuable aid in determining the variety of organisms with which we are dealing, and when grown and vaccines made from them are valuable aids in the treatment of the systemic or local condition, after the focus is removed. Many tonsils on inspection are apparently harmless, but when the above methods of examination are conducted they will be found to contain crypts laden with bacteria, pus and other debris. A very important indication of tonsil infection when pus is not apparent, is a red and inflamed border of the anterior faucial pillar; this rarely remains inflamed unless it is overlying an inflamed, infected tonsil.

Although the tonsils are the most frequent sites of these infectious foci, it is not the problem only of the throat specialist, but that of the man in general practice, the dentist, the stomatologist, the surgeon; in fact every branch of medicine needs to be taken into consideration, so that these foci may be discovered and their removal made certain. Not until each of us has exhausted every measure at our command to this end, can we lay down our arms and say unto ourselves, "Well Done."

Hemorrhagic Abortion and Immediate Evacuation of the Uterus.—Neu states that at the Frankfort University Woman's Hospital, when a case of hemorrhagic abortion is admitted, the uterine secretion is examined at once, and if streptococci are found, the uterus is not evacuated but a conservative form of treatment is pursued. He does not think that the danger of a fatal hemorrhage at an abortion is sufficiently great to constitute a contraindication in the presence of a streptococcus infection.

CERTAIN PHASES OF UTERINE HEMORRHAGE.*

By WOOLFOLK BARROW, Lexington.

One of the most common conditions that we are called upon to treat is abnormal uterine bleeding. Abnormal bleeding is the most frequent sign of pathology in or about the uterus. This subject is so extensive that I believe it unwise to attempt to discuss all the pathological causes, so I wish to limit my talk to some of the non-cancerous conditions. The conditions that I wish to discuss are principally what has been termed myo-pathic hemorrhage and hemorrhage from myo-fibroma of the uterus.

By myo-pathic hemorrhage I mean the hemorrhage from a uterus that is grossly normal but in which there is a fibrosis of the muscles and vessels. This uterus upon examination is practically normal in size, but seems denser and harder than normal. It may be found in either young girls early in their menstrual life or in women at or beyond the menopause. Whether the hemorrhage in this type of uterus is due to the fibrosis or is merely a variation of normal menstruation, I am unprepared to say, for on the one hand Thielhaber has pointed out that in uteri grossly normal, hemorrhage is associated with excessive connective tissue in the uterine walls, and on the other hand Pankow has shown that in older multiparous women there is practically always an excessive amount of connective tissue in the walls even when unassociated with abnormal hemorrhage. Be that as it may, it appears fairly well proven that this so-called myo-pathic hemorrhage is associated with excessive fibrosis of the uterine walls. The cause of this excessive fibrosis is not clearly proven. The most recent idea that I have seen advanced is that it is due to a disturbance of the endocrine secretion.

It was formerly thought that abnormal bleeding in grossly normal uteri depended on an inflammatory condition of the endometrium or in the muscles and vessels of the uterine wall. It has been clearly shown that the inflammatory edematous lining membrane is similar to or actually a form of the normal premenstrual endometrium and is effected by the same influences which control normal menstruation. In normal menstruation the cycle of change in the endometrium is coincident with the cycle of change of the corpus luteum and bleeding is dependent on the latter. So pathological bleeding is now thought to depend on some disturbance of the

*Read before the Fayette County Medical Society.

Graffian Follicle in some stage of its development. This in turn is known to be influenced by some of the other glandular secretions. The subject of endocrinology is too technical and too uncertain for me to attempt to discuss except to say that it is an established fact that all the internal secretory glands have an interdependence of action and that tissue growth, development, etc., depend on the regulated action of these glands. As an example of this, allow me to mention the thyroid enlargement at menstrual time. Accepting the belief that abnormal bleeding is directly or indirectly due to a disturbance in the development of the Graffian Follicle, we will immediately realize that the first procedure in the treatment of abnormal bleeding is a consideration of the internal secretions. To go into slightly more detail, it is known that the ovarian and thyroid secretions have an opposing action. Each gland secretes more than one kind of secretion. For instance, the ovary secretes one substance from the Graffian Follicle, another from the ovarium stroma proper, etc., in fact four different kinds of secretion. One of these secretions opposes or neutralizes perhaps one of the thyroid secretions. As an example of this I would like to mention briefly the history of a patient who consulted Dr. Garr recently. This patient, Mrs. B., 42 years of age, was seen by Dr. Garr during February past. Briefly her history was as follows:

She had a cystic goiter which was operated upon seven years ago by Dr. Wathen, of Louisville, who removed one-half the gland. She improved for a while. In the last two years there was progressive enlargement in the remaining part of the gland. There was loss of weight and increased nervousness. No menstrual disturbance.

She was operated upon in January, 1921, by Dr. Crile, of Cleveland, who removed the remaining lobe with the exception of the two poles. Post-operative convalescence was normal. She gained fifteen pounds in weight in February and March. She was less nervous. Normal menstrual period before second operation lasted five days, moderate flow, occurring every 28 days. February menstruation lasted seven days, some excessive bleeding; March period lasted ten days, was very profuse and flooding. She complained of swelling in lower extremities and puffing of dorsum of hands. She was put on Thyroid Extract, grains two t. i. d. and continued for four days. Menstruation ceased and there was improvement in swelling. One week before menstrual period in April she was given Thyroid Extract, grains one t. i. d.; period lasted

seven days without flooding. She had no swelling of hands or feet.

This case serves as a brilliant example of the inter-relationship of secretions from the thyroid and ovarian glands. For a more detailed study of this subject I would like to refer you to the paper of Dr. Engelbach which appeared in Vol. 4, of Medical Clinics of North America.

To return to the subject proper, the treatment of excessive uterine hemorrhage should be divided into three classes, namely: medical, surgical, and radio-active. I do not mean to say that treatment of any given case should be confined to any one class, as at times it may require all three types of treatment to accomplish a satisfactory result. The choice of treatment depends upon the pathological conditions present, the amount of hemorrhage, the age and condition of the patient, and the complications. To reiterate, "Excessive hemorrhage in the grossly normal uterus is due to a disturbance in the proper balance between the various elements controlling menstruation." The object of the treatment is to restore that balance.

"In young women the disturbance is often one of development, so every effort should be made to restore that balance by general treatment, by endocrinological study and treatment, trying to replace the deficient factor." This is what I mean by medical treatment. To return to myo-pathic hemorrhage. In the treatment of this condition certain general principles should be observed. First, the ability to reproduce must be undisturbed whenever possible. Therefore, the treatment of the patient who is in the child bearing age differs from that of the patient at or near menopause. In the former every effort should be made to preserve the generative organs. In the latter the preservation of these organs is not so necessary.

To better understand the relative merits of the various forms of treatment I believe it advisable to briefly discuss the effects of radiation. You all understand the effect of operation, so I feel that it is unnecessary to mention it here. There are three theories to account for the mechanism by which a fibroid is diminished in size by radiation. The first is that the fibroid shrinks in a manner similar to that which occurs after the woman has passed the menopause. The second is that the rays have a direct action upon the smooth muscle cells causing them to degenerate and become replaced by connective tissue. The third is that the fibroid is starved by an endarteritis severe enough to destroy the smaller blood vessels nourishing the growth. There is further a direct effect on the ovaries, pro-

ducing especially a change in the Graffian Follicles.

In women under thirty an attempt should be made when employing radio therapy, to grade the dose so that there will be a partial return of the menstruation. This is not possible in every case, as of course some patients are more susceptible to the influence of rays than others. However, the principal of underdosage rather than overdosage should be adhered to. By adhering to the small dose one or even two treatments may be necessary before the expected result will be obtained. In women near the menopause radio-therapy is the method par-excellence, as the menstrual balance is naturally disturbed and the cessation of productive ability is not to be disfavored since the natural menopause is imminent. Complications should bear the same weight in uterine hemorrhage as they do in any other pathological lesion. For instance, a woman with a leaky heart or advanced pulmonary tuberculosis is not a fit subject to bear children, nor is she a fit subject for a serious operation, such as an hysterectomy, so the method of choice is the one that will tax her strength the least.

The treatment of bleeding associated with myo-fibromata depends also on associated conditions, the age of the patient, the size and location of the growth, etc. As to the age and size—given a patient near the age of menopause with a small fibromyoma, the treatment depends on the amount of the hemorrhage. Such a fibroid provided the symptoms are very mild should not be treated as all symptoms will probably disappear with the completion of the menopause. Should the hemorrhage be very excessive and the tumor no larger than a three months' pregnancy, radiation is the method of choice unless the tumor because of its location is causing pressure symptoms, or there is an accompanying pelvic inflammation. If the tumor is so large that pressure is exerted, in the absence of contra-indications, hysterectomy is the method of choice. A tumor larger than a four month pregnant uterus comes into this class. The location of the fibroid greatly influences the choice of treatment. For instance, a sub-serous fibroid pressing against the bladder causing symptoms, in the absence of definite complications, is not a case for radiation. This brings up the question of myo-mectomy. In young women, as I have before mentioned an effort should be made to preserve the generative organs, so no radical operation such as hysterectomy or any other procedure that will destroy the function of the uterus, such as radium, should be employed until after a myo-mectomy has failed to relieve the bleeding. In this type of case

myo-mectomy is the treatment of choice, as there is conservation of the menstrual function, no artificial menopause, etc. The objection that myo-mectomy is more dangerous than hysterectomy may be raised. However, by reviewing the paper of Dr. W. J. Mayo, read before the A. M. A. in April, 1920, you will be convinced that myo-mectomy is not extra-hazardous, as there were only three deaths in a series of 617 cases of abdominal myo-mectomy. Another objection often raised against myo-mectomy is the later development of tumors, necessitating a second operation. In Dr. Mayo's series of 741 cases only 1.56 per cent required secondary operation.

The treatment of fibroids in the presence of complications, of course, depends on the character and type of the complications. In the presence of systemic disease, such as severe nephritis, heart disease, etc., the method of choice is the one that taxes the strength of the patient the least. If radiations by X-ray will suffice, that method is the one of choice, as certainly it is much less dangerous than a major operation. Radiations should not be used in the presence of inflammatory disease of the adnexa or when there is a coincident operable disease such as cholelithiasis, appendicitis, etc., in the abdomen. Radiations have been known to light up a quiescent tubal inflammation.

In this paper I had no intention of discussing malignant conditions that cause abnormal uterine hemorrhage, but it seems to me that my paper would be incomplete without at least mentioning malignancy complicating fibro-myomata. The history in cases complicated by malignancy will in the majority of cases lead one to suspect malignancy. A very important procedure in those cases suspected of malignancy is a diagnostic curettage. This applies to not only those cases in which radium is to be used, but also when a myo-mectomy is contemplated. In myo-mectomy the uterus may be curetted immediately before the abdomen is opened and frozen section made, or, during the abdominal operation, the cavity of the uterus may be directly explored by incising the uterus. In radium applications a diagnostic curettage should always be performed. To illustrate the necessity of this procedure I wish to briefly report a case that I treated with radium several weeks ago.

This patient was 56 years of age. Something over one year ago menstruation had ceased for five months. Since the reappearance there was a marked increase in the amount of bloody discharge. No intermenstrual bleeding. Examination revealed a fibroid uterus enlarged almost to the umbilicus. She was very anemic. Hemoglobin 35%, and red blood cells

less than 2,000,000. She had albumin and casts in her urine. To further complicate matters she had a marked systolic mitral murmur of the heart. Besides all this she had a very large strangulated hemorrhoids. Her cervix felt normal in size and no abnormal appearance was noted. The patient was treated with radium and as routine the endometrium was curetted and a section of the cervix taken. Scrapings revealed nothing abnormal, but the section of the cervix revealed an early squamous cell carcinoma.

As my allotted time is about consumed I will conclude my remarks by again mentioning what seems to me to be a few of the most important points, in the consideration of this subject.

(1) In young women conservatism should rule unless complications are present that demand radicalism.

(2) In the presence of pelvic inflammation or coincident abdominal surgical pathology radium is contra-indicated.

(3) In women near the menopause or in whom there is an associated severe systemic disease, radium is the method of choice in myo-pathic bleeding and in fibro-miomata that are not larger than a 3½ month pregnancy.

(4) In those cases where myo-mectomy or radium is contemplated a diagnostic curettment or cervical section, or both, should be made, for in the former an intra-uterine polyp may be present and in the latter malignancy may have supervened.

Significance of Acid Reaction of Peritoneal Fluid in Perforating Ulcer.—Prader reports eleven cases which furnish considerable evidence for the assumption that an acid reaction of the peritoneal fluid in ulcer perforations, even though pathogenic bacteria may be present, is to be regarded as ordinarily indicative of a favorable prognosis, provided the general condition of the patient is fairly good. Primary closure of the peritoneal cavity without drainage is thus justified. Whether this assumption is correct will have to be established by more extensive observations.

Bacillus Botulinus Toxin.—The toxins produced by ten different strains of bacillus botulinus were found by Orr to be comparatively thermolabile. The heating of any food material to the boiling point destroyed all trace of botulinus toxin which might be present. The toxin produced by Strain 2 (Nevin) is apparently much more resistant than any of the other strains.

DIFFERENTIAL DIAGNOSIS OF THE SURGICAL DISEASES OF THE BILIARY PASSAGES.*

By HARRY J. PHILLIPS, Louisville.

During the past twenty years we have gained a better appreciation of the nature of gall stones. Nevertheless, there still remain many practitioners in whose minds the idea of gall stones and jaundice are indissolubly connected. We still hear the assertion "there are no gall stones because there is no jaundice." Jaundice is a symptom that may be present in gall stone disease, but is often absent, and it does occur in many other diseases.

If we think that a patient is suffering from an affection of his liver, our first impression should be of the medical diseases, viz: biliary catarrh, hepatic cirrhosis, and acute yellow atrophy of the liver. If a patient complains of indigestion without pain and becomes yellow but otherwise remains well, we must diagnose catarrhal jaundice. But if the general condition is profoundly affected, and the temperature is high, the disease is infective jaundice. When this rare condition occurs in epidemic form it is known as Weil's disease. When rapid loss of strength and severe general debility are associated with deep jaundice, the patient is suffering from either acute yellow atrophy of the liver—probably the result of poisoning—or some form of septic infection. A certain amount of jaundice often exists in septic conditions, especially septic peritonitis, the skin of the patient possessing a peculiar greenish blue cast, due to the yellow of the jaundice combined with the blue of the cyanosis. A patient who gets about for years, jaundiced but without pain, but who complains occasionally of feverish symptoms and general ill health must be suspected of suffering from hypertrophic cirrhosis of the liver.

Banti's disease is attended by jaundice. This etiologically obscure disease presents hypertrophy of both the liver and the spleen. Wonderful improvement often follows the removal of the spleen and places this rare disease within the scope of surgery.

Secondary and tertiary syphilis may also produce jaundice. The above comprise all of the usual conditions which may suggest gall stone disease. But if none of these seem to fit the patient's liver trouble, we may conclude that he really has a condition calling for surgical treatment. We should think of gall stones, growths, hydatid cyst, and abscess of

*Read before the Jefferson County Medical Society.

the liver. Let us differentiate between the several surgical conditions of the biliary passages.

(a) GALL-STONE COLIC.

As a rule pain is the predominant symptom. The patient is seized, at rare or frequent intervals, with severe pain in the gall bladder region. The pain does not last more than a few hours, or at most, a day, and can be relieved only with morphia. There is no elevation of temperature and no jaundice, and the case is often diagnosed "colic." But the gastric colic is quite different from gall stone colic, both in its outset and its nature. Pains due to gastric colic generally radiate to the left and toward the back; biliary colic radiates toward the right, often as far as the right shoulder. If pain in the stomach is caused by an ulcer, it is increased on taking solid food; if due to hyperacidity, food relieves the pain. In both cases, the pain comes on regularly at definite hours. The pain in an acute attack of gall stones, so-called biliary colic, is quite independent of food, and it occurs at irregular intervals of months and years. In like manner it is differentiated from duodenal ulcer which occurs on the right side and comes on at the completion of gastric digestion.

Much more difficulty in diagnosis, however, is presented by the less severe, temporary or permanent pains which precede or follow a severe attack, or by conditions wherein a decided attack of biliary colic does not develop at all. A stone may be present in the common duct and yet the only symptoms may be those of indigestion, due to transient biliary congestion. Again, there is a numerous class of cases wherein gall stones exist, with a total absence of all symptoms. Thus arises the impossibility of making diagnosis in many cases, unless deep pressure over the gall bladder excites the characteristic pain. The attack of colic itself may be mistaken for an acute seizure of pain in the upper abdomen. It may be so slight as to leave no impression upon the individual, or it may be of so severe a character as to cause him to writhe in agony on his bed or even on the floor. Gall stone colic is differentiated from renal colic by the position of the muscular rigidity. If we press in front of and behind the seat of pain, in a case of renal colic, the lumbar muscles will become rigid, whereas in a case of biliary colic, it is the right rectus which will become rigid.

It has been stated by some observers that in gall stone diseases there is a characteristic painful spot close to the right side of the spine, below the twelfth rib. Adhesions to surrounding structures sometimes cause attacks of pain that resemble biliary colic. It

is often important to be able to decide whether attacks of pain of which a patient complains are really due to gall stones. Two practical rules are applicable in this connection. The patient is able to go to the doctor for many attacks of pain, but the doctor is obliged to come to the patient for biliary colic. An anodyne prescription suffices for ordinary pain, but a hyperdermic injection of morphia is necessary in the pain of gall stones. Exceptions are rare.

(b) ACUTE CHOLECYSTITIS.

A patient is suddenly seized with severe pain in the right side of the abdomen. He has fever, and is nauseated and vomiting, indicating peritoneal irritation. The pulse is good, the skin is normal in color, the abdominal muscles on the right side are tense or become so as soon as they are palpated and we think of appendicitis, because of its frequency. It will be found, however, on further careful examination, that the painful area and the rigid muscles are not at McBurney's point; that is in the line extending from the anterior superior spine to the umbilicus, or below it, as is the rule in appendicitis, but higher up in the region of the gall bladder. Percussion probably shows that the liver dullness is below its normal limits, even extending as far as the level of the umbilicus. If palpation is possible, an area of resistance with its lower border circular in shape will be felt connected with the liver. If this be the condition found, there can be no doubt that the case is one of acute cholecystitis, and if the fever persists for many days, it is surely of a suppurative character. The position of pain and the fever often enable one to make the diagnosis without its being possible to demonstrate the lobular or tongue-shaped area of resistance, so often characteristic of this condition. In such cases we may assume that a contracted gall bladder has become inflamed, and we may usually obtain an old history of gall stones in support of this assumption. (De Quervain.)

Acute cholecystitis is to be differentiated from perforation of a gastric or duodenal ulcer. In perforation, reflex muscular rigidity very quickly affects the entire abdomen, and general peritonitis sets in if the case is neglected, but these symptoms only occur in cholecystitis when an infected gall bladder perforates into the free abdominal cavity.

Acute pancreatitis and pancreatic hemorrhage may also suggest acute cholecystitis, but in these the pain is to the left, and the pulse soon becomes thready and rapid. Differential diagnosis would be easy if the gall bladder and the appendix were invariably in their normal positions. This, however, is not

the case. Sometimes the gall bladder extends as far down as the ileo-caecal region. But more frequently the appendix is high and is directed outwards. At others it is found in close proximity to the gall bladder. These abnormalities in the position of the gall bladder and appendix have led to many errors in diagnosis.

Report of Case: A middle aged woman was admitted to the hospital suffering from acute hemiplegia. The history she gave disclosed the fact that she had been operated upon two years previously for an appendiceal abscess and she subsequently had a persistent fistula in the ileo-caecal region. She died in a few days and the post-mortem showed that the fistula communicated with the gall bladder, which contained several large stones. The hemiplegia was the result of an abscess of the brain, in which were found micro-organisms similar to those in the gall bladder. The surgeon erred in the diagnosis of this case.

When the pain and inflammation occur above the line joining the anterior superior spine to the umbilicus, we should think of appendicitis if the inflammatory process reaches far towards the side and if the lumbar muscles contract on pressure; but any inflammatory condition internal to the external border of the rectus must be ascribed to the gall bladder. If jaundice is present also, we will immediately decide in favor of gall stones. This is usually a good guess, because the extension of the inflammation from the gall bladder to the common duct often causes temporary jaundice. But, it is to be remembered, we often find jaundice associated with appendicitis, even in mild catarrhal cases. If the appendix lies in close proximity to the gall bladder, strung up by bands of connective tissue so that the bile-duets may be involved in the inflammation, the jaundice may be pronounced.

Report of Case: I was called to see a young woman with fever, jaundice and abdominal pains. Upon palpation, the abdominal resistance extended outwards from the outer border of the rectus, and downwards as far as the crest of the ileum. Despite the jaundice and the pain in the hepatic region, a diagnosis of appendicitis was made based upon the lateral position of the resistance. Operation confirmed the diagnosis.

The following rule often enables a correct diagnosis to be made when the painful spot is situated just on the border line; if the dullness reaches as far as the flank, the case is appendicitis, but if an intestinal note can be elicited externally to the painful area, cholecystitis is present. (De Quervain.)

If we still remain in doubt after considering all the physical signs, we must be guided by the rule that appendicitis is more probable the younger the patient, and gall stones the older he is. The possibility of disease of the kidney should also be borne in mind.

Report of Case: Mrs. R. B. H., aged 55 years, had been the subject of severe pain in the hepatic region for years. At operation a thickened gall bladder filled with pus and gall stones was removed. But the attacks of pain continued. They were very severe, of short duration, and attended by fever. The pain was to the right of the umbilicus and above McBurney's point. Careful examination showed appendix and biliary passages to be normal. All x-ray pictures taken showed a shadow in the kidney due to a calculus. The renal calculus was the real trouble and without doubt was present at the time of the first operation.

A special form in which cholecystitis may manifest itself should be mentioned. I refer to the cases of gall bladder inflammation which have been diagnosed as "fleus." Indeed cholecystitis may at its beginning or during its progress, cause adhesions between the intestine and gall bladder, with inflammatory infiltration of the intestinal wall, extensive, serous or sero-purulent peritonitis which may either produce mechanical obstructions, or the toxic symptoms of an obstruction. The previous history of the patient is of vast importance in arriving at a correct diagnosis together with the presence of pain and resistance in the region of the gall bladder.

(c) GANGRENOUS CHOLECYSTITIS.

If the clinical picture just presented is much more severe and septic symptoms develop rapidly, or if a very acute stage is followed by an increased resistance, we should suspect gangrenous inflammation of the gall bladder with perforation, and extensive peritonitis.

Report of Case: A middle aged fleshy man was suffering from severe pain in the upper right hypochondrium. It was discovered that he had suffered a number of similar attacks. Marked resistance developed in the gall bladder region accompanied by high fever, nausea and vomiting. Operation revealed a gangrenous gall bladder, already ruptured, with pus in the abdominal cavity. The necrotic gall bladder, containing stones was removed.

As in the acute form of cholecystitis, jaundice is also here merely an accessory symptom, which is not essential to the clinical picture. But if it is present—and it is usually

temporary—we must conclude that a catarrhal inflammation has caused the closure of the biliary passages and has temporarily arrested the free flow of the bile.

I have hardly referred to the gall stones themselves. This is because we do not diagnose the gall stones, but the inflammatory changes which their presence causes. We know very well that slight catarrhal inflammation of the biliary passages often occurs after gastric and intestinal catarrh, and that very acute cholecystitis may supervene during the course of typhoid fever, dysentery and malaria without any formation of stones. But these constitute only about one-tenth of the cases of cholecystitis which come under observation. It follows, therefore, that a patient who suffers from cholecystitis without any of the antecedent illnesses just mentioned most probably is the victim of gall stones. But it is very regrettable that a purely academic discussion on the matter should cause delay of a timely operation and that a stone, whose existence may be in dispute, should eventually manifest itself by gall stone obstruction and fatal intestinal perforation. It is a matter of slight importance whether the stone is in the gall bladder or in the cystic duct. In the latter case, there will be more evidence of jaundice.

The service of skiagraphy has frequently been enlisted in attempts at diagnosis of gall stones. But as their main constituent is cholestrin, a substance that is almost equally transparent to the x-rays as the soft tissues of the human body, not much has been obtained from this method of examination. Positive results have only been obtained in the very rare cases of pure calcium carbonate stones, and with the cholesterol stones which contain a large amount of calcium and magnesium salts. Pigmented lime stones, on the other hand, are so loosely formed that they can not be detected in a skiagram.

(d) OBSTRUCTION OF THE COMMON DUCT

The clinical picture presented by this condition differs widely from the others. Here jaundice is the predominant symptom; localized dullness and swelling are rarely present. The liver is enlarged, the stools are colorless, and the urine contains much bile pigment. These symptoms indicate that some obstruction is present in the common duct, and we have to determine whether this is caused only by a stone or whether a malignant growth may be present. If stone is causing the obstruction, the inflammatory process affecting the duct will vary, and consequently the amount of jaundice and the biliary content of the stool will be liable to variations.

But if the obstruction is caused by cancer there is a constantly increasing mechanical pressure exerted by the new growth, and therefore the stools are free from bile and the jaundice is persistent. If, in addition, we realize that the pain is not due to congestion of the bile but to the inflammatory process, we will understand that attacks of pain point to gall stones, whereas jaundice without pain suggests a tumor. These are two fundamental differences between the two conditions. But we must be on our guard against diagnosing gall stones merely because there is previous history of biliary colic. In at least five-sixths of the cases of cancer of the gall bladder there has been a previous history of gall stones.

Report of Case: An aged female had suffered from many attacks of gall stone colic. The attacks were severe, of short duration and accompanied by slight jaundice. The last attack was a mild one, and the jaundice, which was more pronounced than in the previous attacks, did not pass off promptly. On the contrary it persisted, and the patient's general health became affected. These symptoms were enough to establish a diagnosis of cancer, which subsequently caused the patient's death.

In diagnosing obstruction of the common duct, Courvoisier's rule may be useful. In chronic obstruction of the common duct, if we are able to palpate a tensely filled gall bladder, we may conclude that its walls are capable of being stretched, and therefore are not chronically inflamed. But as gall stone obstruction generally appears after prolonged suffering, that is to say, after the walls of the gall bladder have undergone chronic inflammation and contraction, it follows that a distended gall bladder does not indicate calculous obstruction, but rather suggests the presence of a growth involving the common duct and leaving the gall bladder itself free. On the other hand, if the gall bladder can not be felt, it is an argument against tumor, and is in favor of obstruction by stone. A symptom that points conclusively to cancer is free effusion in the abdominal cavity.

Report of case: Mrs. P. K., a robust matron of forty-five years of age, suffered severe pain in the hepatic region, and several doses of morphia were administered to allay suffering. The location of the resistance, together with persistent jaundice, justified a diagnosis of gall stones. But the jaundice persisted, and then a slight effusion of fluid appeared in the abdominal cavity as the first indication that the case was malignant. Shortly thereafter, the oedema became general and death soon put an end to the suffering.

Ascites may occasionally appear in cases of obstruction due to stone as a result of cirrhosis of the liver, which is secondary to the biliary congestion. If the symptoms clear up after a diagnosis of calculous obstruction, it does not signify that our diagnosis was wrong, nor can we be sure that the stone has passed. As soon as the inflammatory swelling has subsided, the bile can flow freely alongside the stone, which may remain quiescent in the common duct. If it still remains there after several weeks, it should be removed by choledochotomy. The passage of large stones into the intestine is not, as a rule, affected by the *per via naturales*, but through a fistulous communication between the gall bladder and intestine.

(E) EMPYEMA OF THE GALL-BLADDER.

Frequently, cases occur in which palpation reveals a pear-shaped mass associated with tenderness and pain. If the history discloses that there have been previous attacks of inflammation in the gall-bladder region, with fever and pain, and if the mass is fixed or only slightly movable, a diagnosis of empyema of the gall-bladder may be made.

Report of Case: Mrs. R. M. C., aged sixty years, and fleshy, had several attacks of pain in the gall-bladder area, extending over a period of ten years. When I saw her in the last attack, the area of resistance was external to the right rectus and just below the liver. She had fever but no jaundice, and a tongue-shaped mass could be palpated below the ribs.

Diagnosis: Empyema of the gall-bladder. Operation was performed and a much enlarged gall-bladder with thickened walls, was removed. It was filled with pus and contained two very large stones.

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AT THE HEAD OF THE HOLLOW

By J. F. SMITH, of Berea College and MARION WILLIAMSON, Director of Public Health Nursing, Louisville.

The urgent need for public health work among the poor in the remote sections of the open country was pointed out in a former article. (See SURVEY for December 11, page 399.) Here constructive suggestions are offered for doing this particular kind of work.

A necessary first step is to convince the health forces of the country that there is a tremendous need for such development. The unreached family is a perpetual menace to the health of the neighborhood. Since ill health is closely related to low moral standards, economic inefficiency, uncertain religious conceptions, physical and racial degeneracy, the neglected family at once becomes a potential factor for evil in many directions. This fact the public, including the public health forces, must recognize.

There are various ways of securing this recognition. Here are some of them:

Let the medical and health journals carry articles written by those who know country life at its best and its worst. These articles will tell the truth about the needs and the rewards of the field.

Let speakers who can look from the level of the cabin doorstep appear before conventions and association meetings of public health workers to present the ease of the neglected country child.

Let these same speakers appear before students in the training schools and bring forcibly to the attention of everyone the needs of the unreached child and the great opportunities for constructive service among the very poor isolated rural families.

The needs of the field are great, and these needs must be made known by those who know. But the rewards of service are as great as the needs. Whoever ministers to the people at the head of the hollow will have an active part in perpetuating the purest American blood we have in the land.

A second important step will be taken when the training now given to nurses is so modified that their attention will be directed more definitely to the unreached families of the countryside. There are numerous people dwelling up the hollows, above the spot where the road forks, who need to be considered. The literature now available for nurses has a distinct urban flavor. This is inevitable because it has been produced by people who are more urban-minded than rural-minded. Some

must produce a literature that will bring to the attention of nurses while they are in training the actual living conditions of the rural folk, emphasizing the best as well as the worst. There are books and articles aplenty about country life, but there are exceedingly few that speak with authority of the life of the isolated poor. Country life is not all joy as some journals are inclined to portray it, nor is life in remote places all fried fat meat and bad roads as some casual visitors have at times intimated.

These things may well be brought to the attention of the nurses during their training, namely:

The rewards which the field has to offer. The love and appreciation of the people. the knowledge that a great service is being rendered in homes where nurses are few and doctors are scarce, helping to perpetuate our purest American blood, the best that the open country has to offer—and there is much of this—are some of the rewards of those who enter the field.

The movie, the paved sidewalk, the shop window, the variety theatre, the cafeteria are not there. But those who are inclined to consider these things necessary to happiness should not attempt to enter the field. They will prove to be failures.

Opportunities for growth and development. There is undoubtedly a great future for rural nursing. Successful nurses will be in demand. The nurse who relies chiefly on herself, who improvises much of her equipment will grow. Position and honor will await her. A failure at the head of the hollow does not necessarily mean failure everywhere else, but the nurse who succeeds in a remote field will undoubtedly succeed anywhere.

The requirements for a successful rural worker. Common sense, a strong personality, likable qualities, love for people, knowledge of conditions, organizing ability, optimism. The list is quite familiar.

Only the most resourceful workers will succeed. Hospitals, ambulances, specialists, drug stores will not be found. The nurse must improvise many necessities. If she does not possess an abundance of initiative and inventiveness she ought to stay away from the head of the hollow.

Actual field work in the open country during her regular course of training. The nurse who has had a regular course in a city hospital should by all means have work in public health nursing before she enters the rural field. And one of the most important phases of this work is practical experience in the field. Case work in the city does not and never can adequately equip a nurse for successful

work at the head of the hollow. As soon as this is realized and acted upon by training school faculties, the efficiency of the rural nurse will be greatly increased. Such a course as Louisville offers is most essential.

The social phases of the work. A course in rural sociology and community civics is all important. And the sociology should not be theoretical. It should deal with actual problems of the field, should be taught by someone who knows how to adapt it to the particular section where the nurse expects to work. This information will have to come largely from lectures. Books and magazine articles are not always reliable. A long forward step will be taken when lectures are brought from the various sections of the country to present to students the actual needs, rewards, and life conditions of their fields.

The efficiency of the nurse will be greatly increased if considerable attention is devoted to organized play and recreation. The fact should be kept constantly before the health worker that when people begin to play more the need for medical attention will begin to grow less.

What particular things can the state do to aid in reaching the unreached child? First, the remote neighborhood must be made accessible. It does not matter what plans health organizations make for serving neglected people, these plans are going to break down frequently unless the state builds good roads to the heads of the hollows. The criminal neglect of road construction is responsible for thousands of deaths in the Southland every year. Three of the best medical instruments known for successful work in remote neighborhoods are a pick, shovel and a garden hoe.

Besides this, numerous clinics and demonstrations must be provided for. Talking has its value, and every nurse ought by all means to have some training in public speaking, but the nurse who actually pasteurizes a bottle of milk and sterilizes a baby's milk vessels before a group of mothers will accomplish more than a score of others who merely tell what to do. Eyes must be tested, teeth must be repaired, babies must be weighed, bathed and dressed, wounds must be bandaged with bandages improvised and sterilized on the spot. Clinics cost money but they must be held. Such work as was done is the recent anti-hookworm campaign and is now being done by Dr. Bradley and her health mobile of the Children's Bureau produces more thought and action among people than a whole brigade of speakers could accomplish.

Provision must also be made for examining all the children of the countryside. This may be done in a preliminary way by nurses, doc-

tors, school teachers and other officers. One of the best plans yet devised in the one in use in North Carolina where experts go to all the schools examining children and recommending to parents the particular steps to take in order to restore the children to normal health.

Departments of public instruction must provide for first aid training in all rural schools. Normal schools must add strong courses in first aid and public health to their curricula and must require this work of all students.

To supplement the treatment in the clinics, hospitals must be erected within reach of every citizen, and the expenses for treatment in these hospitals must be kept within the means of the poorest family. From these hospitals extension workers should go out to give adequate instruction to mothers and prospective mothers.

Then too, every effort must be made to insure the production of proper and sufficient foodstuffs for children. When every farmer begins to cultivate a larger garden, when he begins stowing away enough vegetables and fruits to guarantee an ample supply for the year, and when every housekeeper begins preparing the proper food in the right way we may expect to see the amount of illness and the number of deaths greatly diminish. Much of the illness of the open country can be cured with a hand-plow and a stew kettle. In this the demonstration agents must show the way.

The nurse will succeed best who possesses the ability to work with other agencies and induce all the constructive forces on the field to work together. The task is too big to be undertaken alone. Little will be accomplished even though proper assistance be given at child birth to a mother if she is left to feed fried meat gravy, raw sauerkraut and black coffee to the baby as soon as it is a few months old. The mother must be reached through the educational and extension forces in the state, and the father must be induced to produce more vegetables of the right kind, and stow them away for winter use.

Finally, what does a health campaign among the unreached involve?

It means building good roads to the heads of the hollows, erecting district hospitals, inducing people to build better houses and sanitary privies, teaching first aid to every child, instructing every mother and every girl in the proper care of children, persuading fathers to have bigger and better home gardens, instructing everyone in the proper care of the sick, enforcing quarantine regulations, organizing frequent health campaigns, holding numerous clinics and giving demonstrations

in health matters, securing the cooperation of all constructive agencies on the field, counteracting much of the influence of the grannym-doctors, educating the midwives, throttling the patent medicine vender, frequently examining children, providing suitable and abundant recreation for young and old and misistering to the spirit of everyone.

These are but some of the things to be accomplished. The task is a challenge to the strongest men and women in the land.

NOTES ON THE CARE OF THE PREGNANT WOMAN.*

By HARRY L. READ, Louisville.

Obstetrics is one of the oldest features in medical practice. From that good day when Moses was found in the bulrushes, yea from the beginning to the present time, babies have been brought forth in sorrow and travail.

It is true that those who practice in large cities have for a long time recognized the importance of this subject and have given especial attention to it; but it has only been within recent years that those in smaller cities and rural districts have realized the necessity of giving proper care to women during the entire period of gestation.

Statistics show that the mortality of pregnant women between the ages of fifteen and forty-five years is higher than in any type of disease except pulmonary tuberculosis. The proper care of the pregnant woman is one of the surest ways to reduce this mortality. Death of a pregnant woman is to a great extent preventable; such a loss oftentimes affects a community very deeply and involves a serious social loss. We, as obstetricians, must assume the responsibility placed upon us; we must be satisfied with nothing but the most careful attention to our obstetrical work; we must not only acquire the proper technique of delivery and be able to successfully conduct the three stages of labor, but more important still we must possess accurate knowledge concerning the pathology of gestation from the very first month to the time of delivery.

My reasons for presenting this paper are two-fold: First, that I consider this one of the most important branches of medicine; Second, my desire to reduce the mortality as well as the morbidity of the women and babies of our land. Therefore, every woman should consult her physician as soon as possible after missing her menstrual epoch; not that she is ill, for we know that normal

*Read before the Jefferson County Medical Society.

pregnancy is a physiological process, but any deviation from the normal makes her condition pathological.

It is the physician's duty to carefully outline and supervise the conduct of the woman during the entire period of gestation. He should take a careful and thorough history at the first observation of every woman who is pregnant, or is suspicious of her pregnant state. The history should be both family and personal. The personal history consists of the name, age, occupation, previous illness, pregnancies, miscarriages, and complications, if any. He should inform himself as to her general health and especially as to the condition of her heart, lungs and kidneys. In examining the heart it is not necessary to spend a great deal of time trying to determine what kind of heart lesion is present; the main question is whether the myocardium has sufficient strength to withstand the strain of pregnancy, labor and the puerperium. Where a positive diagnosis can be made of active pulmonary tuberculosis, it is questionable whether the pregnancy should be allowed to continue. He should also determine the presence or absence of anemia and malnutrition. All of these conditions are amenable to treatment if recognized early.

It is not necessary for the physician to spend much time at the present day on the hygiene of pregnancy, because of the fact that the public has been taught much along these lines through the various magazines and lay journals. However, sometimes patients are misled and it is our duty to instruct them along such lines as exercise, rest, diet, sexual intercourse, clothing, etc.

If abscessed teeth or diseased tonsils are causing systemic disturbances they should be promptly removed. Gas anesthesia is oftentimes safer for the patient than the administration of coal tar products to relieve pain ascribed usually to neuralgia and rheumatism.

A carefully taken and recorded blood pressure at frequent intervals during pregnancy affords one of the most valuable aids as to the presence or absence of toxemia.

I might say just here that in my city hospital work we have a routine blood Wassermann made, but in private practice this is done only when there is some clinical evidence of syphilis. The earlier in pregnancy this is determined and treatment instituted the better for both mother and baby.

After the patient has been carefully examined physically, so far as I have stated already, she is instructed to send to my office the following day a clean specimen of her morning urine (about four ounces) with name and address on the bottle; and she is

given specific instructions to repeat this at stated intervals varying from one day to one month, as the necessity may demand.

It is universally agreed that the urine is the best single criterion to the approach of dangerous symptoms of toxemia. This is thoroughly understood by the laity, and any physician should be considered negligent who does not examine the urine at least once per month during the last four or five months of pregnancy. The urine should not only be examined chemically but if there exists the least evidence of renal disturbance a careful microscopical investigation should also be made.

It is my custom to make an appointment for a future date, within one week if possible, for vaginal examination, inspection and mensuration. The patient is, at the second visit, more at ease provided she has been convinced of your interest. At this appointment, if the woman is in the first few months of pregnancy, as we presume she is, a vaginal examination and pelvic measurements should be made to determine the position of the uterus, the possibility of her being able to carry the child to term, the presence or absence of pelvic tumors, etc., and whether there is any marked pelvic deformity or contraction.

Another important item is to ascertain whether there is a vaginal discharge. If a discharge is present and there is any suspicion of specific disease, a careful examination should be made to determine its character, and proper treatment instituted.

The external measurements, i. e., the interspinous, intercrestral, intertrochanteric, right and left oblique, external conjugate, and the transverse diameter of the outlet, should all be carefully made. The internal measurement is the most important of all and is termed the internal conjugate.

In the later months of pregnancy the attendant should investigate the condition of the breasts and the nipples, and also whether pendulous abdomen or varicosities exist. The breasts and pendulous abdomen may be supported by proper binders and corsets with much comfort to the patient. If varicosities are present, bandaging of the limbs is important. The nipples should be kept clean, especially during the last month of gestation, and if retracted they should be kneaded and elongated by the patient with her fingers once or twice daily.

It is important to ascertain the size of the child, the presentation, and whether fetal heart sounds are present or absent. It is not necessary to practice the pelvic mensuration in multiparae who give a history of easy

previous labors. In primiparae and also in multiparae giving a history of previous difficult labors, while we may be familiar with the general physical condition of the patient, yet we must make actual examinations and accurate pelvic measurements. This should be done not later than the eighth month. If pelvic contraction is found sufficient to cause serious dystocia, a selective Caesarean section or premature labor should be resorted to.

A careful and complete history of each patient, a thorough examination and accurate measurements, will show the shape and size of the birth canal, the strength and development of the mother, and the approximate size of the passage and the passenger.

In conclusion: It is the duty of the physician to his patient to assure her that you are vitally interested in her welfare; to discuss her case at any time so far as she should know; to always be exceedingly sympathetic and attentive.

If you would wish to have the hearty cooperation of her in the lying-in chamber, you must have done all these things.

DIAGNOSIS OF CHRONIC APPENDICITIS.*

By M. CASPER, Louisville.

The increasing incidence of appendicitis and the frequency of its non-recognition is sufficient reason to make the discussion of its diagnosis a live subject at all times.

Chronic appendicitis is not a trite term, but is rather meaningless except it distinguishes it from the more violent and quickly acting acute form. The acute form being so pronounced and stormy is relatively more easily recognized than the slower insidious chronic form.

Murphy's five cardinal points of recognition usually make the diagnosis certain in acute form, viz: pain followed by vomiting, rigidity, elevation of temperature and leucocytosis. These five points vary considerably but usually run true and with a few other symptoms and the history, make such a plain case that it can not only be recognized, but discovered early enough for proper surgical procedure. In this early recognition, coupled with prompt action, so much depends. We will not discuss the cause of appendicitis, and there are probably several, but we might note that the disease is getting exceedingly more common.

According to A. R. Short, in a splendid and exhaustive study of the causation of appendi-

citis, printed in the British Journal of Surgery of October, 1920, "Appendicitis was present but was relatively rare in their countries (England and others) until the end of the nineteenth century. Since then it has become very common in most of the highly civilized countries." He stresses the fact that it is proportionately more frequent according to the degree of civilization. In this same Journal, A. F. Maylord gives a comprehensive table of sex and age incidence, and while it occurs in each sex and at all ages, it is more frequent between the ages of ten and thirty.

We have been closely watching what we call step by step infections, first focally at apex of pulpless teeth or in tonsils, soon both; then appendix and then gall bladder; ulcer of stomach and duodenum; later heart and kidneys. The step by step procession is not always the same but very variable. Infection probably travels by alimentary tract, blood stream, sometimes lymphatic channels and sometimes by contiguity as from oviduct to appendix, etc.

Anyhow, chronic appendicitis is getting to be an every day disease and we believe it is as common as malaria used to be, and malaria as rare as appendicitis was prior to 1890.

The subject of chronic appendicitis is a large one and as a disorder it is varying in kind, degree and type and for many reasons. Ernest H. Gaither, at the last meeting of the Southern Medical Association, gave a full dissertation on this subject and we are indebted to him, in this paper, for his splendid dissertation on this subject. We do not like his division of cases into his two classes—typical and atypical—as we believe most cases present features of each type. And why shouldn't they? Look at the many factors that enter into each case. We should prefer classification of uncomplicated and complicated cases.

In arriving at any classification, we must constantly keep before us that each case is a law unto itself and that the personal equation is always a factor. Careful history taking is the most important factor in properly interpreting chronic appendicitis. Anybody can take a history, but it takes a real detective to apply it correctly and extract the salient facts. We maintain that these patients will tell you in their history the trouble, the pathology in nine cases out of ten, if we will only assemble and correlate their facts.

We must listen to them studiously alert to every fine detail, carefully disentangle, bit by bit, and discerningly cross examine

*Read before the Jefferson County Medical Society.

them, and we will finally have their whole trouble plainly laid before us. Of course, these patients do not come to us for their real trouble, but for something entirely foreign, as indigestion, constipation, asthenia, neuralgia and so on. The same might be said of many other diseases. Doctors are called for fevers they must differentiate, and then treat the patient as he finds him. We are never called for hookworm, nephritis, etc., *per se*, but are called to remedy certain symptoms of disease as anemia, edema, etc.

CLASSIFICATION

First: The first group of chronic appendicitis includes those with previous distinct, acute attacks, running back sometimes for years and even into childhood. Carefully digested history of these previous attacks will usually put the physician on the correct track, as the history picture is concise and definite. These patients finally develop well marked chronic symptoms as indigestion, coming on at first intermittantly, then constantly, indefinite in the time of appearance with regards to meals; indefinite also as to pain it presents, usually described as a fullness after eating, some gas, belching, epigastric distress, sometimes nausea, seldom vomiting, unless as often happens, we have distinct pylorospasm, with its attending water brash, epigastric pain, hyperchlorhydria, hypercylia gastrica, all being reflex from a chronic inflamed appendix.

These patients often complain of a "catch" in right iliac region, especially on exertion, as a youth running will grasp his abdomen so as to support it, they are conscious of having a "side," as it were. Sometimes they even assume a slight bending forward of body that we have christened the appendicitis "hump." This is done to allow more freedom and relaxation of the abdominal muscles, the contraction of which often causes a pain radiating down the thigh along the ilio-inguinal and ileo-hypergastric nerves.

Group 2. Chronic appendicitis with indefinite earlier attacks of a kind not typical appendicitis, but a sort of "bellyache," will often be overlooked if we depend on a superficial examination. Even the history will tend to throw us off, especially when we think of our own "green apple colic" of youth. These attacks have continued periodically though usually intermittantly and irregularly, but we'll find that they run a rather even course with sudden appearance, some cramping, sour stomach, heart burn, gaseous distention, nausea, anorexia for a day or so, coated tongue, constipation. Such attacks last a day or so, patient looks on it as having something that disagrees with him or it is a

"billions" attack; they often ascribe the coincident relief given by some favorite laxative pill or restricted dieting as their sure-cure-all.

Given then a case of vague digestive disturbances since childhood, with colic, constipation, (occasionally diarrhea instead of constipation or again the two alternating), having to be careful what they eat and often with co-existing, perhaps predisposing, etiological oral sepsis, diseased tonsils, chronic pelvic disorder, previous typhoid or remote infection, let us be on our guard for it is almost certainly chronic appendicitis.

Group 3. Subacute appendicitis in which there has never been an acute attack with perhaps urinary disturbance, severe constipation or neuritis of right leg, any or all. Here we usually have a low lying appendix, often general visceroptosis, with adhesions of bands, sometimes even attached to the bladder, and we nearly always have stasis of the caecum. Gaseous distention of the caecum and increased peristalsis with attendant pull and tug on the more innervated parietal peritoneum, causing reflex pain in the leg and uneasy feeling in lower abdomen.

These cases are usually demonstrable with x-ray and opaque meal. They are also relieved often by simple enemata and the patient often has discovered this relief measure and constantly employs it. Again he considers his trouble trifling and may even slightly mention it to his physician, who may disregard it entirely or prescribe without going into the case thoroughly and neglect to examine the abdomen, much less take the trouble to order proper roentgen charting of the patient's alimentary tract.

Group 4. True chronic appendicitis with no acute or subacute phase. This is necessarily puzzling and comes on so insidiously and extends over so long and constant a period that it has usually influenced the patient's entire life before we see them. This class includes a great many morose, neurasthenic individuals, whose every symptom has been altered by long, slow suffering, low nervous state often complicated with many lesser troubles, which to these self conscious, hapless personages are big problems. We have, however, on careful scrutiny the usual syndrome though it may be deeply concealed, overshadowed by other conditions. This class of cases does not always get the desired and deserved benefits of surgery, and in some cases are even made worse and altogether they constitute a class that requires individual study and careful weighing and estimating of every angle of the case. We do not think they should be deprived of the fruits of surgery

because they are nervous, but they do require very careful, tender handling and close co-operation between the family physician and the surgeon.

Many of these cases have derangement of the endocrinous glands and these alone, if overlooked or neglected, will cause failure. Clean these cases up from head to foot. Every vestige of focal infection must be eradicated, endocrine glands stabilized and broken equilibrium re-established, impoverished blood corrected, etc. We must keep after them until they are well, and nowhere is persistence more richly rewarded than in this type of cases.

Group 4. We might subdivide this class into a further second subdivision including a class in which we have general visceral misplacements with kinks and bands and pathological membranous formation with attendant stasis and a certain amount of low grade peritonitis, all of which overshadows the attending chronic appendicitis.

These cases are especially difficult to handle and we must here have a thorough working knowledge of the whole of the abdominal viscera. We can get much information with proper x-ray examination. If we do touch the case at all it must be with the utmost thoroughness.

Group 5. Chronic tubercular appendicitis, though rare, does occur. It may be primarily infected or extend from adjacent tubercular Fallopian tube. Also it may be secondary to pulmonary tuberculosis and contribute in a marked degree to the seriousness of the general condition of such a patient. From the appendix, the lesion soon spreads to the caecum and ilium, followed by enlarged mesenteric glands, and so on.

Dr. H. L. Sampson and L. Brown of Trudeau, N. Y., have worked out an x-ray diagnosis of tubercular lesions, involving the ileocecal region. First, they show a definite hypermotility of the caecum with rapid emptying, this part being empty when it should be filled, and also showing a spasticity. Second, filling defect with opaque enamata. Carman has also emphasized these points. The physical signs are often in abeyance, but when we have irregular digestive disturbances, gas bloating, (diarrhea more often than constipation) we should examine the ileo-cecal region for further evidence of inflamed appendix.

Group 6. Chronic appendicitis by contiguity. This form is often not recognized until operation, being overshadowed often by more active pathology, usually in the tube and ovary. We should suspect the appendix in all tubal infections, although, no doubt, the appendix is sometimes at fault first and tu-

bal infection is secondary. The close relationship of these two storm centers must be kept constantly in mind, not only by the diagnostician, but obviously the surgeon as well.

Diagnosis: The history of irregular digestive disturbances extending over years, especially beginning in childhood or early adult life, symptoms of gas, bloating, constipation, mild colic, acid dyspepsia, are strongly suggestive and give us a direct lead into the correct diagnosis. The gastric symptoms predominate and deserve closer analogy.

The stomach has been likened to an exchange in a telephone system, a sort of headquarters or centralizing point for all intra-abdominal disturbances. It is most closely in touch with the other viscera because of its highly organized nerve communication, and especially through the splanchnic of which we have yet much to learn. The gastric disturbances in chronic appendicitis are both secretory and motor.

First, we have marked increased secretion of gastric juice and hydrochloric acid both in the early active stages. This is made more prominent by the attending pylorospasm, whether the latter is a cause or a result we do not know, but each magnifies and exaggerates the other without a doubt. This combination accounts for acid eructation, sour brash, heart burn, and is often accompanied by a fiery red tongue. Certain articles of diet exaggerates this syndrome, especially vegetables. From long overwork the secretory glands finally become exhausted and then we'll have achylia and achlorhydria.

Second, motor disturbances may be said to involve both the inhibitory and accelerator muscles of the stomach. The first causes pylorospasm and is probably of reflex origin. The latter causes hypermotility and hyperperistalsis, an effort to force the stomach contents past the rigid, contracted pyloric orifice. This motor dual scener or later leads to a dilated stomach with atony of the walls and it is the latter condition that we usually find when they get to us.

The physical examination should include inspection of mouth, teeth, throat and other possible sites of focal infection, as co-existing or causative factors of chronic appendicitis. Most anyone can tell a diseased tonsil or apical abscesses of dead teeth, the latter usually bluish in color with puffiness of and discolored gum. Also visceroptosis, which, we hold a contributing factor, is recognized at a glance. X-ray will clear up any doubt and confirm any suspicion we may have in many of these conditions. We note the relative rigidity of the recti muscles and we would urge

that palpation be carried on in the unaffected region first, the hand being flatly and very lightly applied over the abdomen. Rigidity may be only very mild or may run in all degrees to marked resistance, there may be even relaxation due to muscle fatigue after being on guard over a long period of time. There is usually an increased tympanitic note over the caecum due to gaseous distended, static caecum.

Morris has emphasized two points in diagnosis. First, the cider barrel sign; this is percussion over left lower abdomen, suggests a cider barrel in October, full; while the opposite is found on the right, suggesting the cider barrel in March, empty. This latter is due to a distended ascending colon. Second, hypersensitiveness at the site of the fused second and third sympathetic ganglia. Deep pressure on the abdomen, about one and a half inches to the right of the navel and a trifle caudal, causes pain, because of the sensitiveness of this ganglionic point. This latter sign is rather constant and is earlier than the first, which is due to a lax wall of caecal musculature. The ganglionic point of tenderness is a reflex irritative impulse coming early from an inflamed appendix.

There is a point of tenderness over McBurney's point, which varies very much in intensity and location. The appendix is not always at McBurney's point, in visceroptosis it will be much below and may even be in the pelvis. Again in certain retroperitoneal appendices it may be higher up than the classical McBurney's point.

The appendix can very often be rolled under the finger. It is surprising how often this can be done by constant practice, especially if we first secure the confidence and cooperation of the patient. Again we can pinch the appendix by compressing it between the palpating finger (better the thumb by a twisting motion) and the psoas muscle; this will cause a sharp pain in the affected appendix. This valuable sign requires some practice and deftness, and we had better always try the left side first so as to not take the patient by surprise and thus be misled by a sudden start. Manipulating right leg by flexion and extension so as to put the psoas on tension may aid us in eliciting this tender point also.

Another similar method can be carried out especially if the large bowel be empty, by forcing the gas back through colon reversely back to caecum and then disturb the sensitive diseased appendix.

Toxic manifestations are by no means lacking and we have abundant evidence that the appendix may be the site of focal infection as important and wide in its remote effect as the tonsil or tooth. After clearing up all

other focal infections in a recent rheumatic, without complete relief, we removed the appendix which gave few signs of pathology by all physical examination, yet there were a few, as indefinite indigestion, that suggested possible appendix involvement. At operation the appendix was found subacutely inflamed with recent adhesions.

Röntgen findings: It is not always possible to visualize the appendix, but when we do we have direct evidence of kinks, enlargement, open lumen (according to Skinner of Kansas City, and Cole, who say an appendix that fills in patient over thirty years old, is pathological); also position, adhesions, etc., are demonstrated by using screen and radiograph.

Most of our x-ray evidence is indirect, we discover the stomach derangements and find out their cause, pylorospasm may be overcome by administration of antispasmodic, thus ruling out again disease of the stomach. The emptying time is usually prolonged. We urge the importance of interrogating the entire alimentary tract, we usually take readings of the test opaque meal at time of meal then at six, twenty-four and forty-eight hours after.

Stasis of the caecum and adhesions around ileo-caecal valve are readily found by x-ray. Also other causes of constipation are ruled out.

Differential Diagnosis: One of the commonest, and at the same time, most difficult entities to differentiate is that of the neurotic. They have learned the location of the appendix, often have been told previously that they had appendicitis and hence may throw one off. We must study them closely and try to get them off their guard, especially in eliciting point of tenderness.

We often have chronic appendicitis in the neurotic, indeed, there is no doubt that a diseased appendix makes these cases more neurotic and as a class they will bear the disease very badly and we think they require surgery even more than their more robust sister or brother.

We must not lose sight of the danger of adhesions in these cases and the possibility of making the patient worse thereby. Strict and rigid enforcement of aseptic technique effectually counterbalances this unfortunate possibility.

Second: Ulcer of the stomach or duodenum. We must keep in mind that ulcer and chronic appendicitis are present very, very often in the same patient and it is hard indeed to differentiate these two, especially when we have the similar syndrome of inhibition of pyloric relaxation after a meal, excessive peristalsis, hyperchylia gastritis and increased acidity.

Moynihan has stressed the importance of

regularity of ulcer distress, coming on at a fixed interval of from one-half to two hours after eating; duodenal ulcer being slower to come on than the gastric, but both coming on regularly at a fixed time after food. Also hunger pain is commonly present in ulcer, that is, pain and distress are relieved by the taking of food, soda, etc., while in appendicitis there is more abhorrence of food during the exacerbation. History is also of greater importance and x-ray will usually distinctly clear up the differentiation.

Third: Cholecystitis. Early cases of cholecystitis are often associated with and preceded by chronic appendicitis. They are extremely hard to differentiate, in the early stages especially. Appendicitis is more frequent in young subjects while gall bladder infections are more common around forty. Always keep in mind Deaver's formula for gall stones, "Fat, fair and forty and belches gas," it is a good foundation to work on. However, either condition may occur at any age. The x-ray is a valuable aid in differentiation, most of our information in gall bladder is negative, that is we rule out the other conditions that simulate it, as appendicitis, ulcer, etc. Cholecystitis in advanced stages are relatively much easier to differentiate for pain is different in character and radiates differently, point of tenderness is quite different, also the history differs, the latter requires very close analogy and abstracting of salient points. No matter how sure we may feel of diagnosis in both cholecystitis and chronic appendicitis, we routinely examined for the other when operating for either.

Fourth. Nephrolithiasis: Difficult in right sided renal calculi and not forgetting that some cases of left sided stone have pain on the right side. This has occurred often enough to render it imperative that both kidneys be x-rayed in searching for stones. The x-ray will locate a stone approximately in 90% of cases, in the remaining 10%, we may have real difficulty in arriving at proper diagnosis. This is especially true in low lying retrocecal appendices, often in direct contact with ureter, thus causing very similar pain to stone in ureter.

Another type that may be confusing is where the tip of the appendix is attached to the bladder and is accompanied by frequent urination. Of course, usually chronic appendicitis and renal or ureteral calculi are readily differentiated. In cases of close similarity even, the x-ray, ureteral catheter and careful history will usually clear up the diagnosis. Other urinary disorders as kinks in ureter, etc., are to be kept in mind.

Fifth. Right sided disease of uterine ad-

nexae: Mistakes of diagnosis here are most often due to negligence of proper bimanual examination of all feminine patients with disturbances in lower abdomen. Again we would call attention to probably co-existing trouble in both when either is primarily effected with any inflammatory pathology.

Many other conditions may come in for possible consideration, such as incompetent ilio-caecal valve, Meckel's diverticulum pre-coecum membrane of ascending colon, malignancy of caecum or appendix, floating kidney, partial obstructions of various possible causations of both ureter and bowel, colitis, localized tubercular peritonitis, partial intussusception, Lane's link, neuritis of abdominal wall, nerves, etc.

RESUME

First: Chronic appendicitis is a very common affection, apparently becoming more widely spread and is often entirely overlooked.

Second: It is prone to cause reflex disturbances which symptoms are too often looked upon as the seat of the real pathology.

Third: In all cases of gastric disturbances the appendix is to be carefully interrogated and excluded before we arrive at a diagnosis of stomach disease.

Fourth: In all cases of chronic constipation, the appendix is to be considered a factor until properly ruled out.

Fifth: Neurotics are to be most carefully studied, and not too eagerly diagnosed chronic appendicitis, but if their appendix is diseased the nervous element is *per se* no contraindication for removal.

Sixth: The x-ray is a most valuable, although not absolutely infallible aid in the recognition of chronic appendicitis.

Seventh: The appendix is sometimes the seat of focal infection and in all focal infections the possibility of multiple foci with the appendix involved is to be kept in mind.

Eighth: Timely recognition of chronic appendicitis will often save the patient the misfortune of an acute attack with dire possibilities.

Ninth: In summing up our diagnosis we must remember how varied chronic appendicitis may be in different individuals and the personal equation is always to be weighed.

In conclusion would say if we will only be alert and on the lookout for chronic appendicitis we will be greatly more useful to humanity by nipping in the bud the stealthy and mischievous blossoming inflammation of this troublesome little organ.

REPORT OF TWO CASES OF CARBON MONOXIDE POISONING.*

By S. C. FRANKEL, Louisville.

Carbon monoxide is the most poisonous constituent of illuminating gas. It concerns us in that it is largely employed for suicidal purposes and cases of accidental poisoning with it are by no means rare. It has been the cause of a number of deaths in our midst of late and it is for this reason that I desire to call your attention to this poisonous gas.

Illuminating gas made from coal contains from 5 to 10 percent of carbon monoxide, while that made from wood may contain as much as 60 percent. Water gas contains 30 percent.

The deadly effects of carbon monoxide are due to the readiness with which this gas combines with hemoglobin and to the stability of the compound thus formed. The affinity of carbon monoxide for hemoglobin is about two hundred times greater than that of oxygen, however, in fatal poisoning with this gas, the greater part of the hemoglobin in the body remains in combination with oxygen.

When recovery takes place it is generally due to the slow dissociation of the hemoglobin compound. The corpuscles, the hemoglobin of which is combined with carbon monoxide retain their normal form and are not immediately disintegrated, but are destroyed more quickly in the liver than are those corpuscles the hemoglobin of which is in normal condition. The whole of the gas inhaled is not held by the hemoglobin, some of it is dissolved in the blood plasma and some of it penetrates the tissues.

In as much as carbon monoxide hemoglobin gives off no oxygen to the tissues, the symptoms of poisoning are practically those of asphyxiation. Besides the indirect effect on the tissues by interrupting the oxygen carrying power of the blood, carbon monoxide is a direct poison and capable of inducing marked destructive changes. Primarily the heart beats slowly and violently and rupture of the blood vessels may occur during this stage.

Secondarily the heart beats rapidly and feebly. The latter is the period of vasomotor paralysis and as a result of this condition, bright red areas appear on the surface—occasionally abnormal motility and violent convulsions are among the first symptoms. Later there may be extensive paralysis which was one of the most prominent symptoms in these cases I present to you this evening.

Case No. 1: Miss C. S., age 21, was found

unconscious in her room where she had been for about eight hours.

Examination at 12:30 p. m., shows a young female patient, who from all appearances seems to be in a quiet sleep; her lips being rosy red, no paleness of face and no cyanosis present. Patient in deep coma, does not respond to any stimuli and all muscles flaccid, pupil dilated and reacts to light. She has bitten her tongue and when her mouth is forced open she chews her tongue. Respiration 32 per minute, fairly regular and shallow; rales are heard over both lungs, she showing some symptoms of edema of the lungs. Heart rate fast, 120 per minute. Pulse weak and of low tension. Systolic blood pressure 78 MM. Unable to obtain diastolic pressure. Babinsky positive. Ankle clonus negative. There was a question as to the cause of the present state of this patient, whether it was a case of carbon monoxide poisoning or whether it was a case of some other poisoning, as there was no history obtainable. A gastric lavage was done. Analysis of the stomach contents was negative as to poisoning. Unable to arrive at a conclusion as to the positive facts in this case, specimens of blood were sent to University of Louisville Laboratory and the following report was promptly returned:

"The blood submitted was subjected to six chemical tests and in each case showed up as a positive test for the presence of carbon monoxide. In attempting to find the degree of saturation used ox blood as a check and approximated about 32% of carbon monoxide. In addition to the HbCO there were all indications of Methemoglobin. On reduction the blood appeared more normal. However, there were all indications of Oxyhemoglobin still present in the blood. This became more evident in that when a trace of sodium bicarbonate was added, then shaking with air and testing it showed tests more like normal blood again, whereas, mere shaking the blood with air did not. It is true that alkalinity does not effect the methemoglobin nor the carbony hemoglobin, however, it does increase the power of the hemoglobin left in the blood to combine with oxygen. All the tests seemed to show that there was still present some absorptive power for oxygen.

In brief, all indications were that the abnormal constituents in the blood were carbony hemoglobin and methemoglobin—the blood not yet saturated with the carbon monoxide.

The blood count was as follows: Leucocytes, 26,200; polymorphonuclear neutrophils, 79%; Eosinophiles, none; basophiles, 1%; lymphocytes, 20%; erythrocytes, 4,800,000; hemoglobin, 85%; Wassermann report was negative. Urine analysis was as follows:

*Read before the Jefferson County Medical Society.

specific gravity, 1.025; albumin two plus, sugar; acetone, diacetic acid and indican; sugar, negative; granular casts and hyaline casts, the former predominating, were present. Blood chemistry: non-protein, nitrogen 63.9; urea, 30; creatinin, 3.7. Laboratory reports with the physical findings and history led us to believe that we were dealing with carbon monoxide poisoning. The patient was taken to the operating room where 600 cc. of blood were given by paraffin tubes. Pulse becoming slower, fuller, and breathing deeper and slower. The pulmotor was used and oxygen was given intermittently for several hours. Proctoclysis of tap water was given and the oxygen inhalations continued after the transfusion. Patient still being unconscious, twelve hours later, another transfusion of 500 cc. of blood was given by the citrate method. Patient showed very little reaction from the transfusion, was still unconscious, involuntary both bowels and bladder and still looked as if she were in a quiet sleep.

Patient being unable to swallow, a pint of milk and two eggs were introduced through stomach tube. The following morning the systolic blood pressure was 98, pulse 110, respiration 24, temperature 101. Patient was moving her hands and arms, rolling head from side to side, and responded to some stimuli. A pint of blood (venesection) was withdrawn. The blood was replaced by pint of normal saline intravenously. Proctoclysis was continued throughout the whole treatment. The third day the solution was changed to glucose and sodium bicarbonate. Eye ground examination made at this time was negative.

On the fourth day of her stay at the hospital patient becomes worse, respiration shallow, labored and fast, temperature 102, right lung showed impaired resonance with somewhat harsh, prolonged expiratory murmur. The heart, which had behaved itself previously, had now become fast and irregular and for the first time a systolic murmur was heard at the apex, and transmitted to the left. The heart had been watched previously to this and at no other time had a murmur been detected.

The patient continued rapidly to grow worse and died 143 hours after admittance to hospital, never having regained consciousness.

Medicine used in this case consisted of caffeine and sodium benzoate, pituitrin, camphorated oil, digitalis, atrophine sulphate, and strychnin. Post mortem findings were as follows:

Congested (hypostatic) and probably lobular pneumonia, bilateral; secondary anemia; infarct, fresh, left kidney; chronic pulmonary tuberculosis, right apex; obliterative, fi-

brous pleural adhesions, left; intestinal polyp; ulcer caecum.

Case No. 2: Miss D. S., young female, age 22, roommate of previous patient, who was found at same time and was brought to hospital and given treatment similar to that which was given the first case.

Blood count was as follows: Leucocytes, 27,300; polymorphonuclear neutrophils, 79%; Eosinophiles, none; basophiles, 3%; lymphocytes, 16%; transitionals, 2%; erythrocytes, per cu. mm., 4,100,000; hemoglobin (method) Falquist, 85%. She also had negative Wassermann.

Urinalysis: Reaction, strongly acid; specific gravity, 1.032; albumin, three plus (catheterized specimen); sugar and acetone were negative; finely and coarsely casts were present.

This girl showed marked reactions following blood transfusions by citrate method.

Five hours after transfusion of 500 cc. citrate blood, her temperature rose to 105.6 axillary, pulse 125, respiration 60.

Treatment of this girl was very much similar to the treatment of other patient with probably in addition to the proctoclysis and intravenous treatment, she was given several hypodermoclysis of saline underneath the breasts. We endeavored to prevent hypostatic pneumonia from developing in both these cases by having their positions changed every thirty to sixty minutes, but in spite of this on the fourth day after admittance this patient developed hypostatic pneumonia with temperature 107, pulse 148, respiration 56, and promptly died. She was unconscious and in the hospital 122 hours.

Anatomical report of postmortem was as follows:

Lobar pneumonia, left; acute pleuritis, left; hypostatic congestion of lungs; edema of left arm and chest wall; congestion of brain; secondary anemia; chronic excoriations of lips.

Most of the work was done by the resident staff of the hospital and especially by Drs. Henry, Allars, Moore and Peoples.

Determination of Blood Chlorids.—The determination of blood chlorids by several different methods is discussed by Smith. It is pointed out that the simultaneous precipitation of blood proteins and chlorids is open to error. A modification of the McLean-Van Slyke starch-citrate-nitrite solution is introduced. The use of trichloroacetic acid filtrates for determination of chlorids is described.

FOCAL INFECTIONS OF THE EAR,
NOSE AND THROAT.*

By GAYLORD C. HALL, Louisville.

In the enthusiasm attending the early revelation of any novel plan or rule of practice, it is perhaps but natural that its application should be broadened or made to stretch beyond its proper limitations. Such has been the case with the fact not theory of focal infections (for having been proved it is no longer a theory but a fact.)

During the past several years much has been written along these lines and if we subscribed wholly to the enthusiastic reports of the most ardent proponents we would be compelled to admit that all diseased processes were the result of focal infection. To these enthusiasts we might quote the reply of the bar keeper in the Texas saloon to the inebriated individual who had just announced that he could liek any man in the state: "Well, it may be so, pardner, but don't you think you are covering a hell of a lot of territory?" Perhaps before going further it would be well to define focal infections.

For the purposes of this paper focal infection is defined to be a disease process in an organ causing pathological alteration and disturbance of function in another organ through the blood or lymph stream but not by extension in contiguity. For example, a nveitis or choroiditis due to a sinus disease is an example of focal infection, but an orbital cellulitis from the same cause is not, as it is merely an extension in contiguity of the disease process.

Surely the voluminous literature and myriad case reports of the past five years justify the unqualified statement that focal infections do actually exist and that such foci are the determining factors in the etiology of disease. In fact, the great achievement of such a conception of disease was that it supplied a logical solution for the etiology of certain diseases that had been studied for many years without success either in determining the cause or a suitable treatment, the most notable examples of this being certain types of arthritis.

Given a case where the manifestations lead one to think of a possible focus of infection there are certain important things to be borne in mind. First and foremost, the case should be studied in its entirety, for an infection causing an arthritis for instance, is not necessarily single.

We must not in our very laudable endeavor to uncover any focus in our own line of work become blinded to the fact that elsewhere in

the body other foci may be equally responsible for the continuation of the morbid process.

We should not overlook the fact that starting as a single focus the infection may transplant its virus in other organs, thus making multiple foci; or finally that there may be associated with a focus some general constitutional condition such as syphilis or diabetes that weakens the system making infections more severe and harder to eradicate or even causing a continuation of symptoms after the removal of foci of infection.

In order that diseases of the ear, nose and throat may be properly appraised as foci of infection and the limits of their influence in etiology be clearly defined it will be necessary to consider them separately.

It is the belief of the writer that focal points for the dissemination of disease are important in direct proportion to the blood and lymph supply of the focus. For instance, looking over the literature of the subject, I find few references to the influence of supuration within the ear, excepting sinus thrombosis, as a cause of infective foci, while the references increase as we consider the nose, nasopharynx, and notably the tonsils. Next to the tonsils the teeth are the most prolific in causing these infections.

Dr. Jos. C. Beck, in 1914, in the *Journal of the American Medical Association*, states: "Why are the tonsils and adenoids most frequently mentioned as the source of chronic focal infection, and why should they in preference to any other chronic focal infected point be attacked, unless that other focal point is more manifestly possible the cause of the general condition? It has been definitely proved by Weichselbaum, Groeber, Wood and many others that the tonsils and adenoid tissue in the Waldeyer ring have the greatest power of retaining infectious material and that the lymphatic distribution to and from these structures is very great.

The essential point I wish to make in this paper is that by removing a definite focal point of chronic infection (tonsils) the resistance and healing power of the patient is given opportunity to recuperate, and the individual thus enabled to destroy other focal points of chronic infection, and putting the system in a condition to ward off acute attacks.

In addition to removing the structures containing the focal point of infection, or evacuating the infected material, we also obtain the predominating organism or organisms in culture and make therefrom an autogenous vaccine or bacterin. Just as soon as the patient has completely recovered from the op-

*Read before the Jefferson County Medical Society.

eration we employ this vaccine in the full dose and continue to do so for an indefinite but prolonged period. This is done to insure complete neutralization of the toxins or elimination of all trouble."

Dr. Norton L. Wilson, in 1914, in the *Journal of the American Medical Association*, says: "In my opinion, however, the faucial tonsils are the most frequent sources of infection. There is abundant evidence in the literature to show that many general infections take place through the tonsils, pharynx and nasopharynx with its adenoid tissue, the peritonsillar tissue, the lymph-nodes and lymphatic tissue of the retropharynx, the lingual tonsils, the middle ear, the teeth, gums and urethra. The ring of Waldeyer is the most vulnerable part of the body and the faucial tonsils the most frequent seat of inflammatory attacks."

This, too, has been my own experience and a moment's consideration of the anatomy of the structures enumerated will confirm the fact that the more abundant the blood and lymph streams surrounding, the more likely the organ to act as a focus of infection.

THE EAR.

Sinus thrombosis excepted, I have been unable to find any reference in the literature to the ear as a focus of infection. Of the eight cases of sinus thrombosis I have seen, seven in private work and one at the city hospital, five recovered; three died. The deaths occurred from pneumonia, cavernous sinus thrombosis, meningitis. Four of the patients showed joint involvement that cleared up without suppuration. The other cases had no distinctive secondary foci that could be located.

As a receptor from the focus elsewhere in the body the ear plays a very small part. Most infections of the middle ear come through the eustachian tube, the rest from the external canal. The affections of the internal ear are for the most part due to trauma, drugs, and disease toxins.

I have now under observation a little girl who following an inflammation in the nasopharynx developed suppuration in the right ear with mastoid involvement that necessitated operation. This case is accompanied by a severe acute nephritis. There was no continued high temperature so it looks as if the involvement were due to the infection, but it is difficult to say whether the infection traveled from the naso-pharynx or the ear.

THE NOSE.

The absorption of septic material from the nose is a rather familiar fact, witness the aching and malaise felt at the beginning of an acute rhinitis. A similar absorption of the

products of a chronic suppuration, as in chronic sinus disease, is capable of producing all the various affections from myositis and arthritis to endocarditis.

In seeking a focus of pus in the sinuses, it must be remembered that one may be unable to obtain a free flow of pus even under suction, nor is this necessary for we have in the hyperplastic ethmoiditis, as described by Uffendorfer, an infective process without the presence of free pus capable of producing focal infection as the following case illustrates.

M. R., age 19 years. Seen January 31, 1918. Left eye. For three years has had spots before eyes and disturbed vision. Right eye normal. Vision, right eye, 6/5; left eye, fingers at six meters. Drops: Right eye normal. Left eye, media hazy; vitreous filled with large foreign floating bodies; cornea shows twenty small gray dots in center; anterior chamber deep; Pulse 80; temperature normal. Nose: left middle turbinal pressed against septum; redder in color than rest of membrane. Has symptoms of cold in the nose; sinuses clear; no pus by suction. Teeth and throat normal. Injection of tuberculin, diagnostic, negative. Kidneys normal.

Sent to hospital and given pilocarpine sweats; iodides. March 5, 1918: Vision, right eye, 6/12; greatly improved; disc seen; floaters still present; large patch of choroiditis above and to nasal side.

March 29, 1918: Removed middle turbinal left side. Vision continues to improve.

August 28, 1918: Refraction. Right eye, 6/5 with 0.25 C. Ax 180. Left eye, 6/5 with 0.50 S. combined with plus 1.25 C. Ax. 90. Media left eye clear; old spot of choroiditis still remaining. No subsequent trouble.

Here was a case of uveal inflammation with choroiditis evidently caused by a chronic ethmoiditis on the left side, which subsided and as it subsided the trouble in the eye disappeared.

As the receptor of trouble from other organs the turbinates are often congested and both breathing and drainage obstructed by inflamed faucial tonsils. The nose returns to normal after removal of the tonsils. I have seen this happen many times.

THROAT.

While conceding the fact that they may sometimes have to be considered separately, the tonsils and adenoids so often present a single unit for consideration we will consider them together. No other point in the entire body has so consistently been accused and convicted of being a focus of infection for other organs as the lymphatic structures comprising Waldeyer's ring. Some have

gone so far as to advise ablation of all tonsils and adenoids however innocent their appearance or little concerned for the disturbance of function of the body.

Such sweeping assertions have been objected to by others and in the attempt to balance the discussion they have leaned too far on the conservative side. As usual, the truth lies somewhere between. It should be our endeavor, by careful study of the case, to either establish or rule out participation of the tonsils in the disease process by considering their position, state of inflammation, retention of secretion, tendency to acute attacks, peritonsillar abscess formation, condition of lymphatic glands draining the area, and at the same time taking into account the condition of their close neighbors, the teeth, gums and sinuses.

If from this consideration it can be reasonably proved that the tonsils are at fault, they should be thoroughly and carefully removed. If not at fault I can see no good reason why they should be condemned.

It should not be forgotten that removal of an organ may not be the best way of treating it and we should keep an open mind toward efforts that will tend to restore function without mutilation, but in the present state of our knowledge, removal is the best way to achieve that result. The following cases serve to illustrate the role of the tonsils as focal infections.

Case 1. Mr. B. B., aged 35 years, seen May 4, 1918. The patient gives history of repeated attacks of acute inflammation involving many of the joints; this often associated with attacks of acute tonsillitis. His feet are badly crippled and he has great difficulty in walking. Examination shows very badly enlarged, inflamed tonsils. These were removed under general anesthesia. Following the operation an acute exacerbation of the joint symptoms occurred, this subsiding in about ten days after which he had no further trouble.

Case 2. Mrs. E. M. R., aged 47 years. Seen January 14, 1919, in consultation with Dr. Solomon. Patient was in bed with acute arthritis involving several of the joints. Had been ill for a number of weeks. Gives history of repeated attacks of tonsillitis. Examination shows thin, anemic woman. General condition poor. Has chronically inflamed tonsils; cheesy debris in crypts. Operation followed by recovery both of throat and joint symptoms, and patient has been free of trouble since.

Case 3. Mrs. R. S., aged 39 years. Seen June 17, 1916. Patient came for extensive disease of the cornea of the right eye. This was

deeply infiltrated; has ciliary injection; great pain and photophobia. Her general condition is likewise poor. She has rheumatic pains severe at times, throughout the joints and muscles of the body that interfere seriously with her work. Gives past history of tonsillitis.

Examination shows extensive scars over both cornea due to former inflammatory attacks. The interior of the eyes normal so far as can be seen, though the left eye is so badly scarred that the fundus details are not obtainable.

Tonsil removal resulted in improvement both of the joint symptoms and of the eyes. The eyes, however, relapsed and further examination showed a positive Wassermann, which became negative under vigorous treatment and the eyes likewise improved, though the scars remained. This case is reported to show the necessity of eliminating other factors besides focal infection.

Case 4. Miss H. K., aged 53 years. Seen August 20, 1920. Patient complains of pain on left side of face, head and neck; pain extending into left shoulder and arm. Has been present intermittently for several years.

Examination of the throat shows chronic inflamed tonsils with cheesy debris in crypts; pus from tonsil on left side, this tonsil being much larger and more inflamed than the other. Removed tonsils under local anesthetic. Two weeks following the operation the pains disappeared and arm and shoulder can be moved without difficulty.

Case 5. Miss R. S., aged 24. Seen August 31, 1920. Patient has an obstructed nose; periodical sneezing attacks; asthmatic seizures. Thought she had hay fever. Has also indefinite rheumatic pains about body, chiefly in joints of hands and muscles of back and shoulders. Since patient came at the time of the hay fever season, she was put under treatment and watched.

Seen November 22, 1920. Still has asthmatic attacks; nose "stopped up;" turbinates boggy; thin, watery discharge; sneezing attacks. The sinuses are clear. Tonsils are red and inflamed; full of cheesy debris; slight enlargement of cervical lymphatics.

December 9, 1920, removed tonsils under local anesthetic. Since this time rheumatic pains have disappeared; the nose is open; she has no further attacks of asthma and now feels perfectly well. Cases of this kind could be multiplied indefinitely, but it will suffice to show the general type of these infections.

I think I can best close this article by quoting the conclusions of Lillie and Lyons, of Rochester, Minn., in an article published in

the Journal of the American Medical Association, April 26, 1919. The title of the article, "Tonsillectomy in Myositis and Arthritis. Results in Two Hundred Consecutive Cases."

1. "It is justified to advise tonsillectomy in every frank case of myositis and arthritis.

2. Marked improvement may be assured from tonsillectomy alone in 79 per cent of all cases.

3. It is necessary to remove all possibility of dental sepsis; by so doing a larger percentage of patients will be improved.

4. The duration of the myositis or arthritis is a factor in the ultimate results, although benefit and even complete cure is obtained in some long standing, chronic cases.

5. Forty per cent of the patients with chronic myositis or arthritis who are invalids will respond favorably to tonsillectomy.

6. The size of a tonsil has no bearing on its possibility as a focus of infection. A careful examination of the tonsillar crypts and a history of throat trouble associated or not associated with myositis or arthritis is essential in the diagnosis.

7. An absence of a history of diseased tonsil in no way eliminates the organ as a focus of infection.

8. A clean tonsillectomy, with the removal of the plica tonsillaris, is necessary in every case."

FOCAL INFECTION IN RELATION TO DISEASES OF BONES AND JOINTS AND THEIR THERAPEUSES.*

By VIRGIL E. SIMPSON, Louisville.

The arthritides claim the attention of the medical profession because of their antiquity and their frequency. A casual perusal of Osborn's "Men of the Stone Age" convinces one of the verity of the former, and but a brief clinical experience emphasizes the latter.

FOCAL INFECTION AS A CAUSATIVE FACTOR.

Comparatively few joint diseases are due to degenerative change, or are of metabolic origin.

The role of focal infections as causative factors in arthritis has become so well known and so frequently emphasized that one is tempted to use the term radicalism in connection with the importance attached thereto. While disclaiming adherence to this radicalism and recognizing that not infrequently these affec-

tions are due to causes other than focal infections the limitations of the symposium, of which this paper is a part, exclude all discussion of causation, pathology, clinical manifestations or treatment of arthritis depending upon any agency primarily other than an infectious process obtaining in some structure other than those of joints and, of necessity, antedating the joint insult.

With this premise clearly understood it is necessary to mention only the fact, apparently often overlooked, that infections of diffuse types may cause arthritis.

This condition may occur in one of three ways: by direct implantation of the invading germs in the joint simultaneously with the systemic infection; by producing a terminal focal infection which persists after the subsidence of the general condition which ultimately induces an arthritis and, finally, by activating an inoperative focal infection already existing, or in other words, foci may thus be made to continue which they did not establish.

Primary foci are most commonly found in structures contiguous to or communicating with cutaneous or mucous surfaces. The most usual sites are found about the head—the mouth, pharynx, nose, accessory sinuses, middle ear and mastoid, while less frequent sites are found existing in the larynx, bronchial tubes, esophagus, stomach, intestines, genitourinary tract and glands. A chronic infection in any of these sites may be symptomless. The same principles underlie and govern these focal infections as obtain in systemic or diffuse infectious processes.

Any of the pathogenic organisms may cause focal infection which in turn may cause an arthritis. Cocci and bacilli alike may be the causative factor and they may operate as pure or mixed cultures. Mixed infections are more frequent than invasions by a single organism.

DISSEMINATION OF GERMS FROM PRIMARY FOCI TO THE JOINTS.

Pathogenic agents find their way from the site of primary infection into the joints by one or more of three routes:

(a) Through the capillaries germs find easy entrance into the blood stream and may be regarded as bacterial emboli which become lodged in joint structures. If numerous or virulent characteristic reactions occur in the area of lodgment such as multiplication of leucocytes, plasma and native tissue cells in the infected site with necrosis, gangrene and chemotaxis, if of low virulency or less numerous they cause local hemorrhage and fibrinoplastic exudate which ends in connective tissue overgrowth.

*Read before the Jefferson County Medical Society.

(b) The germs may pass from the primary foci to the lymph nodes which may fail to check their progress and hematogenous invasion results.

(c) A general systemic intoxication may occur from invasion by either exo or endotoxic organisms. The exotoxigenic germs excrete soluble toxins in the foci which reach the general blood stream while the endotoxigenic agents may release toxic material from the foci by bio-chemical action or autolysis. It seems more probable, however, that most of the joint involvements are caused by pathogenic agents being carried by either the lymph or blood streams direct.

NATURE OF THE JOINT INFECTIONS.

Arthritis caused by hematogenous or lymphogenous transmission of germs may be either primarily acute or chronic or, secondarily chronic from acute processes. The virulence, dose and kind of organisms are the determining factors in the degree of tissue response. Acute conditions may subside or disappear without impairment of function from anatomical change in joint structures. This termination is more likely in joint invasions from a primary focus elsewhere than in primary joint infections. On the other hand, if the germs are pyogenic, destructive changes may occur slowly or rapidly with permanent impairment of function.

In the chronic types due to non-pyogenic organisms proliferative changes take place causing limitation of motion, ankylosis and muscle atrophy. All types of arthritis may be caused by infectious processes—peri-arthritis, synovitis or osteoarthritis or any combination of them. They may be degenerative or atrophic and proliferative or hypertrophic. Focal infections as causative agencies induce varying degrees of tissue involvement and dissimilar types of pathology because of varying dosage or virulence of the germs.

A FEW OF THE MORE IMPORTANT SPECIAL TYPES OF ARTHRITIS.

Acute rheumatic fever is caused by the diplococcus of Poynton and Paine or the diplococcus rheumatica. This organism is not pyogenic and hence the tissue reactions in man are never destructive. It has been found in the tonsils, accessory sinuses, alveolar abscesses and the lymph nodes as well as cultured from the stools, urine, blood, and joint exudates of patients suffering from rheumatic fever. The mode of infection is hematogenous. Fibrinous exudates and local hemorrhages may result in proliferation of connective tissue and plastic adhesions of serous surfaces. The germ may be found in the joint the first few days of the attack but migration of the cocci ceases on the subsi-

dence of exudation. Conditions in the joint are unfavorable for their growth and death and disappearance soon occur by autolysis and the aspirated joint exudate appears sterile. This explains the disappointment so frequently experienced in an effort to make autogenous vaccine from the joint exudates. The tonsils are the most frequent site of primary infection and the rheumatic fever may occur simultaneously but more often it follows the attack of tonsillitis. The severity of the tonsillar attack does not necessarily determine the degree of severity of rheumatic fever.

The incidence of rheumatic fever is greater in the young because of the excess of lymphoid tissue in the pharynx. The diplococcus thrives best at low temperature which with the lowering resistance by exposure to cold explains the greater incidence of rheumatic fever in late fall, winter and early spring months in this climate. No immunity seems to be conferred by one attack but rather an increased susceptibility obtains.

Gonococcal arthritis presents a well known clinical picture. It may follow an acute urethritis or some days or weeks duration, or an activation of a chronic one. It is generally polyarticular and periarticular and periosteal inflammation are by no means rare. The gonococci seldom cause suppuration in the joint but the lesions tend strongly to chronicity and may remain latent for months then activating a lesion elsewhere in the body. The germs reach the joint through the blood stream and become lodged as an embolus either in the fibrous tissue beneath the synovia, deep in the capsule or in the superficial portions of the joint. The acute inflammation may subside with no adhesions or ankylosis but if the infection has been extensive destruction of the joint cartilage and marked connective tissue cell proliferation may occur. Bursitis and tenosynovitis are frequent coincidents. A curious resemblance to the pathology of arthritis deformans is observed in some chronic forms which have been latent and then progress without any symptoms of infection. Another bizarre end result is the bony ankylosis of the vertebrae which show in the skiagraphs.

The fluid from these joints may contain gonococci if drawn early in the attack but the serous fluid of joints is not a good medium for these germs and with increase in duration recovery becomes less and less likely. Often cultural attempts are successful where smears fail. A cystologic study of the aspirated fluid often aids in differentiating a tuberculous arthritis, since in the gonococcal type an excess in the polynuclear cells is usual.

Tuberculous arthritis is usually secondary

to a tuberculous osteomyelitis of the epiphysis and hence is secondary to a focal infection even of the osseous system which in turn is a secondary involvement. Tuberculous infection of the lymph glands of the mediastinum and mesentery is common in childhood and if the level of resistance be high enough it becomes latent but should conditions become favorable in later life infection of the epiphysis occurs through either lymphogenous or hematogenous channels.

Tuberculous arthritis is frequently mistaken for rheumatism but with immobility more or less complete, absence of leucocytosis, swelling but with little or no evidence of active inflammation and the tuberculin test but little difficulty should be encountered.

Syphilitic arthritis is a focal infection in the sense that the chancre is the primary lesion and from it the spirochetes are carried by the lymph and blood streams causing systemic infection. Syphilis is an example of pathogenicity of germs with a specific affinity for types of tissues and the bones are frequently involved.

Chronic infectious arthritis in addition to being caused by tuberculosis and syphilis may also be caused by typhoid fever or the various strains of streptococci. When it takes on the deforming type it is usually due to streptococci of low virulency strain. They reach the joint via the blood stream and become lodged in the terminal vessels of the periarticular tissues and in the branches of the nutrient artery which ends in the epiphysis. Cellular infiltration chokes the small vessels, a sero fibrinous exudate results in edema of the periarticular structures and the synovial sac becomes more or less filled with sero fibrinous fluid. The severity of the symptoms depends on the virulence and number of organisms reaching the joint.

Acute osteomyelitis is often associated with infected compound fractures but it may be of focal origin from alveolar abscesses, tonsillitis, etc. Few diagnostic errors are more deplorable than to mistake this condition for a rheumatism. The pitting on pressure, the localization of the lesion and the marked leucytosis should serve to obviate the mistake generally.

THERAPEUSIS.

1. *Removal of Foci*: The treatment of the arthritides can be considered intelligently only by consideration of the etiology except in so far as general principles are involved. Fundamentally, the complete eradication of the primary foci is imperative if lasting results are to be attained. It is not always as simple or feasible to do this clinically as it

appears didactically. No matter how rational may be the measures employed to correct the joint conditions or how scientific the agencies used to improve the patient's general condition or how well directed the effort to raise the general level of resistance, if the chief etiologic factor be allowed to persist recovery cannot obtain. Neglect in observing or ignorance in appreciation of this elementary principle permits the arthritis to progress until with retrograde metabolism and uninterrupted arrival of the infectious agencies, irreparable structural damage has been done to the joint.

Removal of the focus of infection, then, is a *sine qua non* in the treatment while such eradication before the development of the arthritis conserves health and usefulness and even life itself. Children with infected tonsils may thus be saved disabling arthritis, as well as other sequelae by efficient medical care or the mechanical removal of the diseased glands. Eradication of dental alveolar infection is recognized as a necessity when causing the arthritis; sinuses and hollow visci should be drained when infected and appendices and glands removed.

The indiscriminate removal of tonsils and extraction of teeth constitutes a reprehensible chapter in modern medicine.

Careful examination and study of organs and intelligent x-ray findings in the matter of teeth will save many useful and sound teeth and obviate the dangers of operative procedures where not indicated.

It is usually possible to demonstrate foci of infection and failure to remove them when found thus permitting a continuous or intermittent bacteremia is certainly one factor in progressive, chronic, infectious arthritis.

With the foci removed the management of the case becomes a matter of properly balanced diet, tonics, exercise, passive and active, hydro-electro and mechano-therapy, mental diversion and manual work rationally controlled.

II. *Vaccines*: A consideration of vaccine therapy in arthritic conditions necessitates grouping the indications under two heads: (a) Its use to eradicate the foci causing the arthritis and (b) its employment in the endeavor to combat the joint lesion itself. Concerning the first indication it may be said that broadly speaking, vaccines find their greatest field of usefulness, in a curative sense, in infectious processes characterized by chronicity and localization. The more nearly any focus of infection causing arthritis conforms to this type the more likely will vaccine therapy be serviceable. An essentially localized, chronic area of bacterial infection

may persist because the local tissue cell structure has become exhausted or non-reacting and by giving a vaccine the remaining portion of the body may be stimulated to participate in a struggle in which hitherto they have taken no part. The whole body is thus drafted into service and antibody formation and phagocytosis are given the needed impetus and recruits go steadily forward to succor the exhausted cells in the infected area. While the focus of infection is yet in the grip of an acute process there is generally little need for a vaccine, for acuteness means resistance and resistance means cell activity and cell activity where germs are involved means antibody formation and phagocytosis. Only if the virulency of the invading organisms be very high or the dosage be massive can it be conceived as necessary to marshal the forces of the rest of the body. It must be remembered that even in the chronic, localized focus the use of vaccine is not all sufficient if pus be present; drainage is essential to stop the absorption of toxins which may be equally the result of a vigorous autolysis or a product of vigorous colonization. If the arthritis be the result of a general instead of a local infection the use of a vaccine is still less warranted as a routine procedure. In these conditions whether due to pneumonia, typhoid, streptococic sepsis, what not, there is a bacteriemia and the whole body is already overtaxed and the probability of doing actual harm by increasing the burden by using vaccines as ordinarily prepared should be as clearly understood by the clinician as by the serologist. Summarizing, it may be stated that in a chronic, non-progressive or feebly progressive, sluggish process, especially when localized, vaccine therapy may activate the muted forces of other tissues and hasten recovery while in general infections presenting a bacteriemia and a febrile state vaccines are not merely not indicated but actually contraindicated.

To control the arthritis, which is the other assumed indication for vaccine therapy, the use of a vaccine has not given very satisfactory clinical results. The difficulty of obtaining cultures from joint affections, especially when they have passed the more acute stage, has already been referred to and if the invading organism can not be identified how can a vaccine be selected? If the kind of germ can be determined then the same principles hold true with regard to the joint condition as have been set forth concerning the primary focus.

When a vaccine is determined as indicated it would seem unnecessary to emphasize the desirability of using an autogenous vaccine for most of the types of infection. The de-

termining factors in chronicity of most infectious processes are the changes in the infecting organism either before or after entrance which make it more resistant to attack by the agents in the patient concerned in establishing his immunity. These are called serum fastness and organ specificity. If an attempt to establish an artificial active immunity is to be effective it must recognize these factors and a vaccine made from the strain of organisms causing the arthritis should be used, therefore, an autogenous vaccine.

III. *Immune Sera*: Sera differ very materially from vaccines in their relations to the immunizing processes. A vaccine is given to stimulate the patient to make his own antibodies in larger quantity than hitherto able to generate. A serum contains the antibodies already formed and available for use. The immunity from a vaccine is usually longer lived than that from a serum. Protection from vaccine is slowly established, at least a week after the initial dose must elapse with most germs before any appreciable immunity is established. A specific serum gives protection at once. Vaccines give best results in chronic conditions while sera meet acute processes most satisfactorily. The use of sera for arthritis has not been highly successful. Antigonococcal serum given subcutaneously has not been markedly helpful; intra-articular injections have resulted in more benefit, but when it is remembered that gonorrheal arthritis is usually polyarticular and frequently periarticular presenting anatomic relations making introduction of the serum quite difficult, the method is far from heartening. The intra-articular injections of anti-meningococic serum in meningococic arthritis offers a more hopeful outcome, in fact, prompt recovery frequently follows. The enthusiastic statements of manufacturers of biologic products constitute almost all of what might be considered favorable for the use of anti-streptococic serum.

Antistreptococic serum is not of itself bacteriacidal since streptococci will multiply in it as a medium. But the cocci are more easily engulfed by the phagocytes after being brought in contact with the serum. The explanation of antistreptococic serum, then, is that it makes the streptococci in the patient more phagocytizable and its failure to establish a cure rests on the fact that in severe infections the leucocytes rapidly lose their ability to digest the cocci. Time, then, is an important factor in the treatment of streptococic infection by serum; the earlier it is given the greater the possibilities in aiding in recovery. It follows then that an

arthritis following in the wake of a general infection is less likely to be benefitted by the serum than one due to a focal infection. There is no official standard in the United States for antistreptococcic serum and the profession must depend upon the guarantees of the manufacturing biologic house as to potency. Laboratory tests of commercial products purchased on the open market have shown an unwarrantably large per cent inactive. This fact offers another explanation for failure clinically in some cases.

Under the best conditions the concentration of opsonins is never very high and experience has demonstrated the advisability of giving large doses of serum. From 30 to 75 cc. are considered as a necessary initial dosage and clinical symptoms must be relied on as a guide for repetition in the absence of a complete laboratory to determine the opsonic index during the treatment.

The serum may be used as a prophylactic measure with considerable success but it must be borne in mind that the immunity thus established is short lived—lasting not more than two weeks. The use of this serum as ordinarily prepared establishes a protein sensitization and a subsequent use induces anaphylaxis.

IV. *Non-Specific Protein*: Medical literature is replete with reports of cases of arthritis in which some degree, much or little, of improvement has been obtained from intravenous injection of non-specific foreign protein. Analysis of reports from dependable sources warrants the conclusion that this improvement is frequently of short duration. This seems especially true of the more recent types unless the original foci have been removed. Relief from pain is obtained in a sufficiently large percentage of the cases to justify its use, perhaps, even in the absence of evidences of improvement in any other way. In other words, as most of the joint diseases are due to infection, local or focal, foreign protein as a therapeutic measure is not contraindicated in the absence of certain conditions e.g., heart, which would make its administration distinctly dangerous. Indeed, enough data has accumulated from relatively trustworthy sources to make its use alluring, to say the least. Acute and subacute arthritis and peri-arthritis respond more pronouncedly to this treatment and those that have gone on to structural changes with muscle atrophy and ankylosis will show least benefit.

The injection of foreign protein causes no negative phase so far as a specific antibody production is concerned, therefore the usual interval of 5-7 days between doses is not nec-

essary. It may be given daily but because of the severity of the reaction it is advisable to give it on alternate days. The number of injections may vary from 2 to 10.

A variety of substances have been used in this form of therapy, sterile albumose, bacterial proteins and horse serum all cause similar results. Bacterial proteins has come to be the protein of choice and typhoid vaccine is the one generally selected. The standard stock vaccine meets all indications and is readily obtainable.

The dose is an undetermined factor but most clinicians consider that an amount sufficient to cause a definite chill secures the maximum benefit.

Acute endocarditis, pericarditis and uncompensated or decomposed heart lesions should be regarded as definite contraindications to administrations.

Some ingenuous theories have been offered in explanation of the occasional benefit derived from the use of non-specific, foreign protein. It has been regarded as a plasma activation; as a stimulating of blood cell-making organs causing a leucocytosis; as an exfoliative stimulation of cells causing a shower of antibodies into the blood stream hitherto attached to these cells; as a stimulation of endocrine glands; as an activation of enzymes; as a heightening of the permeability of cell membranes—all bearing evidence rather of sophistry and enthusiasm coupled with not a little of commercialism in a procedure so lacking in uniformity in beneficial results than of a research study in laboratories and hospitals. When a physician makes bold to treat 466 cases of diphtheria with normal serum as did Bingle, even the characteristic Teutonic tendency to exploitation scarcely serves to explain the tendency to ignore the propriety of treating of micro-organic origin with non-specific proteins so long as effects obtained are but temporary in a vast majority of cases.

The question of non-specific protein therapy is yet in the incubator; who knows what the hatch may be?

It has recently been suggested that it may be possible to use intravenously the non-toxic protein of foreign protein thus exciting the mobilization of helpful ferments without the painful, disagreeable, even dangerous, clinical phenomena which attend such injections of unmodified proteins. This suggestion is based on the theory of Vaughn that a protein molecule may be split into toxic and non-toxic substance by the development of a specific proteolytic ferment.

V. *Electrotherapy*: Briefly, the physical effects of electricity may be grouped under

three heads: (a) electrolytic, which depends upon the property of electrical currents dissociating ions with the formation of new chemical combinations; (b) thermic, which is due to the passage of currents through tissues offering resistance to such passage; (c) mechanical, which rests upon the conception that electrons are matter passing through matter or, electricity passing through cells.

Considering the physiological effects of electricity as viewed from these three physical properties, electrotherapy is, indeed a field rich in possibilities because capable of producing marked structural changes and increased metabolism.

To secure the electrolytic action a current of large amperage and low voltage is selected. The thermic effects are best obtained by the direct d'Arsonval current which is entirely devoid of electrolytic action; quantity and frequency are the two qualities possessed by a high frequency current and may be employed with the highest degree of toleration. The mechanical effects may be derived from all currents but is best obtained from the static current. The modalities from a static machine are practically nil when not interrupted because the flow is small, but when interrupted at a rate below 600 per minute marked contractions are obtained.

In treating arthritis by electrotherapy, a few fundamentals must be appreciated. Induration is prejudicial to repair because a tissue with its blood vessels engorged and exudation and transudation obtaining interferes with circulation; proliferative changes obtain as end results and functional impair obtains. To aid in restoration to normal the embryonic tissue must be broken down, softened and carried away, and whatever causes successive contraction of tissues, squeezes out exudates and transudates through the lymph channels, removes obstruction and pressure and facilitates restoration of circulation and repair is highly helpful. This is all accomplished by the mechanical effects of electricity when the proper modalities are applied.

In the acute stages of arthritis the high frequency current is most satisfactory. It causes hyperemia without mechanical effects, flooding the area with fresh arterial blood and places the germs at the mercy of the phagocytes. The earlier treatment is begun the better will be the results. Mechanical currents are contraindicated because they break down walls of induration which tend to localize the infection and render a general infection possible. The causative organisms are not determining factors in estimating results from electrotherapy as applied to arthritis

except those due to germs not destroyed by phagocytes. Gonococci, diplococci, streptococci, tubercle bacilli infection alike are amenable. Syphilitic arthritis is not benefited since the spirochetes are not phagocytal.

In chronic arthritis induration has been established and the induction of hyperemia does not open the channels and relieve the swelling.

The static current offers the best means of dissipating the induration in this class of conditions.

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THE HEART AND FOCAL INFECTIONS*

By WILLIAM A. JENKINS, Louisville.

The trend of modern discoveries and investigations have completely revolutionized our conceptions of the heart. We now know definitely that the specialized functions of stimulus production, excitability, conductivity, contractility and tonicity are essentially myogenic in origin. It is more than probable, as Dr. James MacKenzie suggests, that the heart muscle in its process of evolution retains many of the functions of the primitive cell. Accordingly, by a type of specialization of cell function, the heart muscle cells take on, or exhibit, functions which are commonly supposed to belong only to nerve cells.

With the foregoing conception as a working formula we conclude that the heart muscle in the normal state secretes a material, or substance, which accumulates to a certain point, then discharges its force upon the muscle with the resultant contraction; then a reaccumulation occurs and so on. This phenomenon is called stimulus production.

Now it is very evident that the heart muscle must have resident in it the power to receive a stimulus and respond thereto by a contraction. The muscle then enters into a refractory stage (no excitability being present) and again the cycle is repeated. This property is nominated excitability. The rate

*Read before the Jefferson County Medical Society.

of the heart, then as you can readily see, would depend on the integrity of, and the inter-relationship which exists between these two functions, viz: stimulus production and excitability.

A third power which is found present in the heart muscle is that of conductivity. All primitive cells have the power to pass on a given stimulus to neighboring cells. This is called the function of conductivity. The heart muscles possess this power to a very high degree of sensitiveness.

Fourth, Contractility. The power to contract is of course the most obvious and outstanding of all the cardiac functions. By the proper performance of this function the circulation of the blood, and even life itself, is maintained.

Fifth, Tonicity. Tone is a property of muscle tissue where ever found. This property is accordingly found present to a very characteristic degree in the cardiac muscle. According to the observations and experiments of physiologists and investigators we estimate the amount of tone present by the varying degrees of relaxation of the heart muscle. This property may be studied by experiments on suitable animals, using drugs which increase or decrease it. Finally we come to recognize its importance and significance in studying diseased conditions of the human heart.

The foregoing may be said to constitute a very brief and precursory statement of the myogenic doctrine of the heart. Although these statements are strictly true, it is at the same time very evident to all of us that this important organ is regulated and controlled directly by the nervous system.

The heart participates or furnishes symptoms in a great number of diseases.

One group of cardiac conditions is naturally and essentially functional or neurotic in origin; another is the result of "wear and tear," or "overwork," or the series of degenerative changes incident to chronic diseases and old age. A third, and perhaps the most important group of cardiac diseases is produced by micro-organisms, localized infections or focal infections.

On first thought it would seem that this important organ would seldom become the site or focus of infectious organisms because of the facts that, first; on account of its protected anatomical situation, it is not possible for it to come in direct contact with any external contaminating influence or factor; and, second, from the fact that none of the channels or portals of entry by means of which infectious materials gain entrance into the human body are directly connected with this organ. In spite of all this, however, a deeper

scrutiny into this matter quickly and firmly convinces us that all too frequently this important organ does become a focus of infectious material with most disastrous and far-reaching consequences.

The cardiac tissues are seldom the first or primary focus of infection, chiefly for the reasons given above. However, there is sufficient clinical, pathological and post-mortem evidence at hand to convince us that such a condition does obtain now and then. Infectious material may gain entrance into the system by any of the ordinary channels, or portals of entry, fail to localize, enter the circulating fluid, the blood, and thence be carried to the heart and other finding a suitable "*Locus Minoris Resistentia*," fixation and multiplication on the part of the organisms takes place; and tissues change or pathology is the end result, and thus we have a typical primary focal infection.

The commoner and usual method, however, is for the infection to become first localized somewhere along the line of its portal of entry, e. g., the gastro-intestinal tract, the air passages, the integumentary structures, etc., and after gaining a foothold in this situation the infection then gains entrance into the blood stream and by continuity or contiguity of structure the heart may become a focus of infection secondary in type.

Reliable textbooks on pathology and the post-mortem reports of pathologists inform us that tubercle bacilli, pneumococci, pus cocci, (staphylococci and various types of streptococci,) meningococci, colon bacilli, anthrax bacilli, and diphtheria bacilli, have all been found in cardiac tissues.

Syphilis frequently invades the heart, either the endocardium, particularly in connection with the aortic valves, or the myocardium where there is an especial tendency to invade the neighborhood of the conduction bundle of His: often producing dissociation of the rate or beat of the ventricles from that of the auricles, bringing about heart-block (Stokes-Adams disease.)

Many diseases of unknown etiology, which bear all the earmarks of infectious processes, are known clinically to invade the heart.

Infections may localize in any part of the cardiac structures. Clinically speaking, the order of involvement from the standpoint of frequency is about as follows: First, the endocardium alone; second, the association of endocardium and myocardium; third, the involvement of the myocardium alone; fourth, the involvement of the pericardium alone; fifth, the fact of a possible pancarditis.

When the cardiac structures become the site or focus of infectious material, the ulti-

mate effects are not at once apparent. In a majority of instances the cardiac invasion is masked by the clinical picture of a generalized or systemic infection, and the cardiac damage is not recognized or felt until months or years after the aforementioned systemic factors have subsided. The vegetations on the valves, rings, and other parts of the endocardium are at first soft, pliant and inflammatory in character; later, they become transformed into fibrous or connective tissue, masses of which undergo contraction (as does scar tissue in any situation) and it is this latter feature, namely the contraction, which warps and distorts the valves, rings, etc., thereby producing all the clinical and pathological features of a well advanced and disastrous chronic endocarditis.

The same is true of the myocardium or the pericardium, the invading infection starts the process, plants the seed, as it were, which in turn is followed by an insidious and subterranean degenerative change, or a type of substitutive fibrosis which weakens and in time destroys the efficiency of the heart.

These factors should be better understood by physicians generally, and if this relationship with its ultimate consequences were constantly and intelligently kept in mind, in handling infections wherever found, the human race would be very much benefitted, life would be prolonged and the prevalence of cardiac infections would be very much reduced.

A consideration of the facts herein discussed warrants the following conclusions: First, that the cardiac structures are prone to become the site of focal infections in an astonishingly large number of the known infectious diseases; second, that on account of the clinical and pathological circumstances detailed, said infections (in the majority of instances) are not recognized in their earlier stages or phases; third, that when the fact of infection is definitely recognized the damage has progressed to the point where cure or repair is impossible; fourth, that physicians should understand thoroughly the direful consequences and disastrous end results of cardiac infections; fifth, and most important of all, that they should be taught to be constantly on the lookout for such infections, have a thorough understanding of the principles of prophylaxis in order to prevent them if possible, know how to recognize them at the earliest possible moment when they are present and lastly, be able to manage them scientifically and rationally to the best advantage of the patient in whatever stage or state they may be encountered.

FOCAL INFECTIONS OF THE GENITO-URINARY ORGANS.*

By OWSLEY GRANT, Louisville.

In considering the types of focal infections which give rise to symptoms throughout the entire body it is readily appreciated that from what we might term the "floor space" of the genito-urinary tract alone, comprising the area from the tubules of the kidney, through the ureters, the bladder, the urethra, down to the manifold labiriths of the epididymus, testicles, seminal vesicles and prostate is very great in itself. When we consider that this area comprises in reality a very small portion of the body because the tracts are made up of folded and interwoven interstices of mucous membrane, we readily comprehend that here lies a most likely harbor for any germs that migrate or originate in this tract and makes them difficult to expel because the outlet is tortuous.

Since bacteria gain access readily either through the lymph or blood streams or from neighboring intestines which continually harbor pathogenic bacteria, as well as from direct introduction from the outside, and from the urine whose true purpose is to carry away the waste products of the body, we can readily expect to find any type of infection here. The fact that drainage is both Nature's and the surgical method of eliminating infective foci is recognized, and in the ramifications of the genital and urinary systems the myriad of folds and pockets tend to hinder this and consequently make it a hot bed for their development.

In considering focal infections we think always of the indefinite and difficult determined causes for ailments which make themselves manifest by fever, pains in the joints and muscles, lumbago, general malaise and often absolute invalidism. In this discussion we want to determine where to look for and how to definitely locate the nidus. All specialists naturally are prone to consider that portion of anatomy with which they are most familiar and the most frequent offender because they see more of that type, but it is recognized now that no general examination is complete without a careful consideration of the genital and urological tracts, and a systematic examination of these will often reveal the offending member.

First, the kidney. All disease of the kidney manifests itself at one time in its course by the excretion of abnormal elements in the urine; albumin, casts, sugar, pus, blood, bac-

*Read before the Jefferson County Medical Society.

teria, crystals, etc. Too often a chemical urinalysis alone fails to give the clue and the microscope should be used in every case. One fact must be remembered, however, that many badly damaged kidneys do not so manifest themselves at all, the cases of so-called "autonephrectomy," and at the time the patient is seen his urine may be quite free from abnormal constituents, the entire urine coming from the healthy side. This patient may have a large renal stone, or pus kidney, plugged with pus or mucus in the ureter and this can be positively determined only by the x-ray or ureteral catheter. The statistics quoted by Greditzer of some St. Louis hospitals gives an index to the number of renal conditions wrongly diagnosed and gross injustice done the patients where a careful urinalysis was left undone. In this series there were 62 cases of pyelitis, 9 percent correctly diagnoses before admission to the hospital or clinic; 42 cases of pyelonephritis, 7 percent correct; 34 cases of calculus with 26 percent correct. The work of Hunner, of Baltimore, who believes so many cases of ureteral stricture infective in origin, thus producing a vicious cycle is familiar to everyone.

Secondly: The Prostate and Seminal Vesicles. Gonorrhea alone is not the sole offending cause in this locality as is so generally believed. Their proximity to the rectum makes these organs a most frequent site of infection with colon bacilli and extension from rectal ulcer, and their intimate association with the urinary tract makes them susceptible to damage by the bacteria of acute infection excreted through the urine. Many chronic sufferers from general conditions give no symptoms referable to the urinary tract, but careful palpation reveals a boggy prostate or distended fibrous vesicles which pour forth pus and bacteria when massaged. The number of cases of backache, lumbago, joint pains, etc., which are afforded relief by systematic massage of the prostate and gentle emptying of the vesicles is paramount testimony of the part these organs play. Many disturbances of the prostate and vesicles are not the direct result of infection in themselves, but due to either excesses sexually or abnormal continence or masturbation they become distended and accumulate secretion which like residual urine is a fertile field for infection. The enlarged hypertrophied prostate forms a pocket of the "bas fond" of the bladder which is not emptied by voiding, just as in the atonic bladder of tabes or paralysis, and here we have another site for growing bacteria. These hypertrophies cause also a back pressure on the ureters and kidneys which gradually infects and destroys these organs and many distant rheumatic and neuritic symptoms disappear

after the removal of the prostate. The prostate of chronic gonorrhea is such a bug bear to all that it is useless to mention it here except to say that many cases of gonorrheal joints are relieved by vasopuncture and drainage of the seminal vesicles.

Thirdly: The Testicles and Epididymis. These are frequently the first site of infection which later progresses upward, such as tuberculosis. Tuberculosis of the epididymis is often painless and may escape the notice of the patient entirely and only be discovered by careful palpation of the experienced.

One other phase of remote effects of lesions of the urinary tract is the neurasthenic and hypochondriac. Lesions of the verumontanum, which as far as has been determined is the site of sexual activity in the tract are often overlooked. These vera viewed by the urethroscope often show great engorgement, sometimes definite pus pockets or ulceration, and frequently retention cysts on their surface. The interest manifested by all humanity in its propagation naturally centers many of the ailments in its sexual apparatus, and such as the above at the site of the vera are frequently responsible for the dejected, morose and mentally inactive mind of the abused and misunderstood neurasthenic.

Thorough examination of the urinary tract of course must include strictures of the urethra which hinder drainage of all the organs above it and consequently contributes greatly to the retention of infection.

While of course realizing that all indefinite symptoms are not due to the genital and urinary tracts, yet recognizing that many of them are, we urge that a consideration of this important possibility, even probability, be given not after all other possible foci have been exhausted, and the patient suffering still after his teeth and tonsils and even part of his intestine may have been extracted, but that a thorough examination be made of the genito-urinary tract, by palpation, and massage, and microscopical examination of the urine, and if further doubt remain, with urological instruments of precision and direct vision, at the same time with the other examinations, remembering also that the patient may have more than one focus in the body and that, as the humorist has paraphrased it, "Rome was not burnt in a day."

DISCUSSION

A. L. Bass: Dr. Hall has given us a clear conception of the manifestations of focal infection relative to the ear, nose and throat. The subject is one of considerable interest not only to the specialist but to every practitioner of medicine. Focal infections may be called "poten-

tial dynamite." They may lie dormant for an indefinite period, then suddenly produce some manifestation which may cause irreparable damage.

Within the last year I can recall a case of frontal sinus infection complicated with an optic neuritis, vision being reduced to 20/70 in the involved eye. Under proper treatment vision returned to normal, also the inflammation of the nerve head.

A child nine years of age with acute ethmoiditis, with vision 4/200 in the affected eye, normal in the unaffected eye. The vision and optic neuritis returned to normal under treatment.

A man with antrum infection was operated upon by me and the drainage continued to be profuse. About ten days after operation he told me he had an abscessed tooth. The left antrum was infected, and the tooth was the right inferior molar. This tooth was extracted and the antrum infection promptly subsided and the patient gained ten pounds within two weeks.

A man came to see me with the history that he had noticed he could not see well out of his right eye for twenty-one days. His vision was 20/200 in the affected eye and the vitreous was cloudy. I could not see the fundus. The blood Wassermann was negative. His teeth were examined by the x-ray and three or four abscesses found. These teeth were extracted. When the patient returned in about six weeks his vision was normal and the vitreous clear save for a couple of small fragments of choroidal pigment.

It is not uncommon to have chronic discharging ears from tonsils and adenoids especially in children. In adults where the tonsils are the foci of infection complicated with arthritis and myositis I think it advisable to have an autogenous vaccine made from the tonsil and give the patient a course of injections prior to removal of the tonsils. The vaccine will assist nature to neutralize the toxin produced by the invading organism and render the patient less liable to have a reaction (if any) after tonsillectomy.

Edward R. Palmer: I wish to speak particularly with reference to the points mentioned in the most excellent paper by Dr. Grant. I think it is quite proper that the attention of the profession at large should be called to the important role the prostate gland plays in the production of vague and widely distributed pains occurring in men beyond the middle period of life. I have had many cases of this kind under observation.

A man now under my care had been treated eight or nine weeks by various remedies internally administered for relief of what was thought to be rheumatism. He had been a patient of mine previously at which time he had oxaluria and slight prostatic irritation. From the fact that

under my treatment he obtained prompt relief from these troubles, he came to see me again presenting the history of rheumatism. He had been in bed for about five weeks and had lost thirty pounds in weight. He complained of severe pain particularly about the lumbar region. Examination showed the prostate large and boggy, and although his urine showed absolutely no evidence of trouble before prostatic massage, after this was done microscopic examination of the material collected showed it to be loaded with pus and blood. Under three treatments by massage the man markedly improved.

I have had many cases of this character without antecedent venereal history. The prostate may become infected because of its close proximity to the rectum.

I have a patient under observation now who has a decided discharge of pus which is evidently from the prostate and the only micro-organism I have been able to detect is a rod-shaped bacterium which I take to be colon bacillus. This is a condition which not infrequently follows the various infectious diseases, such as typhoid fever, measles, pertussis, pneumonia; and particularly I have noticed several cases during the last epidemic of influenza.

I would suggest that every general practitioner when he encounters cases of vague rheumatic pains, to follow the advice given by Dr. Grant and investigate the prostate in the beginning and not leave it until the last.

M. Casper: This subject is one of the most important that we have had under discussion for a long time. We have had a splendid symposium on focal infection and it would be well for every member of the profession in the city and in the state for that matter, to read it. There has been a great deal said and written about focal infection during the last few years, and in some channels it is a subject that is very well understood and appreciated, while in others it is not.

Patients are seen day in and day out who have been the rounds of different physicians, the latter having overlooked many of these simple focal infections. They are not infections hidden deeply in the body many times, but they are very apparent on superficial examination. These patients have really been largely overlooked or neglected and they have not been getting what is coming to them at the hands of the medical profession. Many times the patients themselves can be of great assistance to the physician in removing focal infections.

Not long ago I attended a dental society meeting and heard a debate on focal infections, and strange to say, the side which opposed the extraction of pulpless teeth won the debate. Many of the dentists took the stand that it hurt their business which is probably true as they extract

a tooth only once and the treating and tilling of teeth has constituted an important part of the dentist's work for a long time. They cannot be made to realize that if some way is not devised to repair the damage done to a tooth without devitalizing it that it should be extracted. I think members of the profession as a whole are now taking this stand, and this is the vital issue where the dentist and the medical man meet, a sort of twilight zone, i. e., the space just beyond the root of the tooth, and that is where abscess formation many times occurs. I think that is one of the most common focal infections. The tonsil runs a very close second, it is sometimes secondarily involved, and probably is frequently the site of primary involvement. As Dr. Hall has said, it is not always the enlarged tonsil that is infected, more frequently I believe it is the so-called submerged tonsil which gives trouble.

I have been watching the appendix, the tonsils and the teeth, the gall bladder, etc., and have found focal infection of these structures associated with each other quite frequently. I operated today upon a patient who had no symptoms of gall bladder infection, but did have symptoms referable to the appendix, for which I primarily operated; and in routine exploration of the gall bladder it was found distended with calculi and upon being opened was found filled with pus. In this case the woman had seven abscessed teeth; she had disease of the tonsils and palpable disease of the appendix, the end of it had sloughed away and the lumen was filled with what appeared to be sterile fluid. This is merely one type of focal infection, we must look for many others.

As Dr. Palmer says, the prostate gland may be involved in any or all of these focal infections. We have not done our patients thorough justice unless we have given them a minute examination and sought all possible foci of infection, and even then many times something will be overlooked, there will be some symptoms remaining which are undoubtedly due to focal infection, the source of which cannot be found. By that time it may be deeper in the body and thus escapes detection.

Quite recently I have had two very pronounced cases of focal infection from phlegmon of the hand. In both, the kidney was attacked, giving the patients an acute nephritis with pus and tube casts in the urine and all the usual symptoms of acute nephritis. One patient was a medical man, the other was a man I have had under observation and know he has had no kidney trouble for the last fifteen years. I operated upon him fifteen years ago for gall bladder disease from which he made a good recovery. His urine had been examined from time to time since and there has been no evidence of kidney involvement. Both these cases of acute

nephritis promptly subsided with drainage of the phlegmons.

Orville R. Miller: The subject of focal infection is of considerable interest to the orthopedist, because cases of this kind are sometimes found intractable when they come under observation. I have noticed it has been mentioned in the literature that the *Cammellan-King* diplococcus is often found in the joint where arthritis occurs in association with tonsillitis. When streptococcus is the organism found it is most frequently the streptococcus viridans. Almost any other organism may also be found causing an arthritis. After the arthritis is well established, especially after the patient has reached middle life, damage is very frequently done that is irreparable, the joint structure having been so destroyed that only a fixed joint can be hoped for.

There is little that can be added to what Dr. Simpson has said, but I would like to mention that so far as arthritis is concerned, focal infections are most frequently found in the lower part of the body, the lower spine, the sacro-iliac joint, the knees, etc. In the upper part of the body focal infection manifests itself as a myositis, neuritis, or bursitis usually, except where there is a general arthritis deformans.

Antogenous vaccines should be administered where they can be obtained from the affected joint, with fixation in the acute stage, and later such other treatment is indicated as hydrotherapy, electrotherapy, massage, etc.

During my service in the Hospital for the Ruptured and Crippled, New York, we found in a great many cases that the injection of pituitary extract relieved the pain of arthritis. Of course, the disease was not arrested by this treatment, but so long as the patients were given injections of pituitary extract every two or three days, pain was greatly relieved.

S. G. Dabney: Dr. Hall mentioned a case he has under observation at present where the patient has nephritis complicating acute suppurative mastoiditis. I had the pleasure of seeing that case with Dr. Hall and some large adenoids were removed at the same time.

I have seen nephritis complicating ear cases quite frequently, but nearly always they have been ear cases following some other infection. It is sometimes difficult to determine whether nephritis follows or precedes the original infection. In these cases adenoids were also present.

In Dr. Hall's closing remarks he referred to statistics from the Mayo clinic. I think he omitted one important item. They had four hundred cases but only reported two hundred. They divided their cases into two groups: (1) people under the age of thirty-five, and (2) people over thirty-five. The prognosis in the two groups was very different. They show, rather con-

clusively I think, that in myositis and arthritis, young people get far more benefit from tonsil operations than older people. In contradistinction to this, however, one of the best results I have ever seen was in a doctor aged fifty-nine years, with blood pressure of 185mm.Hg. systolic, with one hand so swollen, and think that he could not use it. Tonsillectomy was performed under local anesthesia with little pain and almost no bleeding. He told me that he used no treatment after the operation. He is now well and the swelling of his hand has entirely subsided. He naturally attributes the good result to tonsillectomy. Of course, this is only one instance, but it shows that even in elderly people good results may be obtained. Barker, N. Betto, and many others have made the point that people in early life are more apt to be benefitted by removal of tonsils and adenoids whereas, people in later life are more apt to be improved by attention to the teeth. However, there are numerous exceptions in both cases.

J. Garland Sherrill: The field that has been covered is very large, but I do not want our old friends the gall bladder, the appendix and the genital tract to be entirely neglected. Of course, everyone who discusses this subject approaches it from his own particular standpoint. Chronic infection of the Fallopian tubes and vulvo-vaginal glands are sometimes important foci of infection.

The point is worthy of comment, in this connection, that Riggs disease does not develop in young people who give ordinary care to the teeth. The disease can be entirely prevented by instructing children how to care for their teeth. This is now being done in some communities, but the matter is entirely overlooked in others. The medical and dental professions should educate the public along these lines.

An infected tonsil is undoubtedly a menace to the patient. However, I must confess that I believe it was placed there for some particular purpose. In my opinion the tonsil protects the individual perhaps by "sifting out" bacteria or rendering them less virulent, and in many ways protects against severe and virulent acute infections. Therefore I believe that where the tonsil is practically normal it should be allowed to remain undisturbed. Of course, where it is diseased and apt to cause trouble elsewhere, when it is acting as a focus of infection, then tonsillectomy is indicated.

There is one thing which we must all realize, and that is the importance of preventative medicine. I think it was Sir James MacKenzie who stated that in the majority of instances the physician was dealing with end results, that the patient was already crippled, and very little could be done by treatment. I think he is the gentleman who went to Scotland and established a clinic with the idea of treating disease in its

early stages and in that way bringing more vigorous men and women to maturity.

Common sense is necessary in the practice of medicine just as it is in any other department of human endeavor. We should always bear this in mind. The Chinaman, for instance, pays the doctor when he is well, but pays nothing when he is sick. I think that is a very satisfactory adjustment of affairs and might be applied elsewhere to advantage. Under such a system disease could be detected early and we would not be called upon to treat patients for end results.

Gaylord C. Hall (closing): There are only a few points to which I wish to refer in closing. Regarding infection of the ears from tonsils: I do not regard that as focal infection but extension by contiguity from the throat through the Eustachian tube.

With reference to the eye: Focal infections are to be found chiefly in the uveal tract. While it is true infection of the optic nerve may at times be due to the absorption of toxic material, more frequently it is due to extension directly from the posterior ethmoid or sphenoid sinus by contiguity to the optic tract. Very slight infection from these sources may cause disturbance of the optic nerve by direct extension, but this is not the result of focal infection.

With respect to the prognosis of arthritis in children: The study that Dean, of Iowa City, has given to these cases deserves considerable attention. He has emphasized the fact that in many of these cases the arthritis may continue without interruption following removal of tonsils and adenoids. The thing to do in such cases is to look for sinus disease, and the elimination of sinus infection in these children often results in prompt improvement in the arthritis.

I mentioned the fact in my paper regarding the existence of acute nephritis following ear infection, stating that I thought probably the infection came from the naso-pharynx along with the ear infection.

I think the question of age in relation to recovery following any method of treatment or arthritis is highly important, because we all recognize that the longer arthritis has existed the more changes have occurred in the joints, hence the less results from any kind of treatment; but sometimes good results are secured even in long-standing cases when the focus of infection is removed.

Referring to the remarks of Dr. Sherrill: I realized when preparing my paper that the ear, nose and throat represented but a small part of the subject of focal infection. The other portions of the body mentioned are also important from the standpoint of focal infection, and as stated in my paper I think every case should be studied in its entirety in our efforts to determine the foci of infection.

Regarding the function of the tonsil: I think that is a matter purely for speculation. I doubt whether it prevents or protects the individual from acute infections, because if that were true, acute infections would more frequently follow removal of the tonsil, whereas, as a matter of fact, acute infections are very rare in patients who have been tonsillectomized. In children, for instance, the general health is greatly improved after tonsillectomy and the chance of contracting any type of acute infection correspondingly lessened.

V. E. Simpson (closing): The management of arthritis is always a difficult problem with the doctor. As stated in my paper it is a comparatively easy matter usually to determine the source or sources of focal infection, and relatively easy to remove them; but it is an exceedingly difficult proposition clinically to obtain in a satisfactory percentage of clinical cases a corresponding improvement in the joint. It must be remembered that the joint structures are poor media for development and growth of many kinds of organisms, and unless the doctor sees these cases sufficiently early and careful bacteriological study made of the joint structure or transudates, failure to find any kind of organism may be expected. When apparently sterile joint secretion is withdrawn by the aspirator needle, the doctor is left wholly at sea as to what sort of specific therapy should be used.

I think we are all agreed that in those cases where the organism can be demonstrated, where it can be demonstrated and definitely labeled, the administration of vaccine made from the type of organism that is causing the trouble generally leads to the best results. The use of so-called stock vaccines for conditions of this kind when we do not know the type of infection present is merely "taking a shot in the dark."

The management of joint troubles has given me personally as much concern and has met with as little satisfactory results as any other line of work that I have been obliged to follow.

Botriomycosis of Lung.—With the pulmonary symptoms predominating at the beginning of the disease and persisting for several weeks in such a manner as to suggest pulmonary tuberculosis, McJunkin's case resembled a primary bronchopneumonia which terminated fatally. The histologic lesion is that of a typical granuloma and is one not encountered in infections with pyogenic cocci commonly examined microscopically. The zooglea-like matrix likewise is unique. The appearance of the delicate circle of hyalin material about individual organisms, which stains positively and is not a retraction zone, suggests a true bacterial capsule, and, if confirmed by further observations, especially in connection with animal inoculation, would indicate a distinct species of capsulated coccus.

BRONCHIAL ASTHMA.*

A REVIEW OF I. CHANDLER WALKER'S WORK.

By LEON K. BALDAUF, Louisville.

Our present conception of bronchial asthma is essentially different from that held for many years. This difference consists in the recognition of two types, bronchial asthma and asthmatic bronchitis, and in the determination of an etiology hitherto little understood. The present day conception seeks to associate typical bronchial asthma with sensitization to some particular proteid and the attacks of a typical bronchial asthma—or asthmatic bronchitis—with some respiratory conditions and, occasionally, focal infections; in other words, they seek to define bronchial asthma as a condition anaphylactic in origin and asthmatic bronchitis bacterial in origin. Essential as this difference may appear to our understanding of the disease, it is well not to be too dogmatic since not infrequently asthmatic bronchial attacks approach very closely to those of typical bronchial asthma, and not infrequently asthmatic bronchitis may have an origin both proteid and bacterial.

An attack of true bronchial asthma, according to Walker, consists of the following cycle of events: "Some type of foreign protein acting either centrally or peripherally as an irritant on the nerves that innervate the smooth muscular tissue lining the bronchi, causes a spasm or constriction of the bronchial musculature. The muscles of inspiration are equal to the task of drawing air through the constricted bronchi into the air cells of the lungs, but the elasticity of the lungs; together with the muscles of expiration, are not sufficient to expel the inspired air in the normal time so that expiration becomes prolonged and is finally interrupted by an inspiration before the normal amount of air has left the lungs. Consequently, as an attack progresses the lungs become overdistended with residual air, and sooner or later this over-filling of the lungs with air causes labored inspiration, although expiration remains more prolonged and more difficult than inspiration. The attack is now at its maximum, and may continue for only a few minutes or a few hours. At the height of the attack, the patient may develop a dry cough which in a short time may become productive in raising a more or less characteristic type of sputum. This sputum is thin, clear, slightly tenacious, and in it are suspended small, white, tapioca-like masses of mucus called Laeunice's pearls. Usually there are quanti-

*Read before the Louisville Medico-Chirurgical Society.

ties of eosinophiles present in the sputum, but they are of little diagnostic significance since they may be present in any sputum, nasal secretion or inflammatory exude. Charcot-Leyden crystals, Curschman's spirals and bronchial casts are not found frequently enough in such sputum to be of diagnostic importance. The attack of asthma begins to subside when the sputum is raised. There is no fever and only a slight elevation of the pulse rate accompanying the attack. After the attack has subsided the patient may be more or less fatigued, but is otherwise normal and free from all symptoms until an attack is suddenly precipitated hours, days, or months later, depending upon when some foreign proteid is again encountered.

On physical examination during an attack of typical or true bronchial asthma, inspection verifies what has already been described, and in addition there may be some cyanosis. Percussion of the lungs during the height of the attack reveals a high-pitched resonance. On auscultation expiration is prolonged and feeble and inspiration is wheezing and accompanied with dry rales; after expectoration has developed there may be moist rales. Fluoroscopy of the chest at the height of the attack reveals a motionless diaphragm which seems to be fixed in a depressed position, and the lungs expand very slightly on expiration. An analysis of the patient's alveolar air shows a low carbon dioxide content, although the blood at the same time shows a normal carbon dioxide content. After the attack has subsided, fluoroscopy of the chest and analysis of the alveolar air show normal findings, and the patient's lungs vital capacity is normal. An examination of the blood may reveal an eosinophilia, but this is of little diagnostic importance."

"The atypical attack of bronchial asthma is usually associated with respiratory infections such as colds and bronchitis, chronic bronchitis, catarrhal conditions of the nose and throat, and occasionally with infections of the teeth, tonsils, sinuses and rarely with the infections located in any part of the body. The primary cause is bacterial infection. Proteins are not the cause of this type of asthma, with the exception that occasionally bacterial protein may be the cause, and, therefore, in only these occasional cases may this type of asthma be anaphylactic. Patients with this type of asthma usually develop their attacks in one or two ways. The most common manner is as follows: The patient has been subject to bronchitis for a period of months or even years. During this time the symptoms of bronchitis have progressed and have become more and more severe. At first, possibly,

there may be only a slight unproductive cough which may have followed a neglected cold; later the cough is more annoying, and may become productive of expectoration. There may or may not be slight fever, and the patient—since the physical signs are practically negative—may be suspected of having tuberculosis. After a time there is some difficulty in breathing, especially on exertion. Later still respiration becomes wheezing and dry rhonchi are heard on auscultation. If these symptoms progress no further the condition is called bronchitis. If, however, the patient develops attacks of dyspnea (which is inspiratory in type) and suffocation, with or without exertion, the condition is called bronchial asthma. In reality the condition is a severe type of bronchitis and does not simulate typical bronchial asthma; the condition is more correctly asthmatic bronchitis."

There are two methods of determining proteid sensitivity, the intradermal or intra-cutaneous and the cutaneous method. The former has been discarded because it is too delicate, and in some cases non-specific. The cutaneous method is performed in the following manner: Small cuts about 1-8 inch long are made on the flexor surfaces of the fore-arm of depth sufficient, but not so deep as to draw blood. On each incision is placed a portion of proteid and a drop of 1-10 normal sodium hydroxide to aid in its solution and rapid absorption. A control of sodium hydroxide alone is used always for comparison. The proteids are washed off at the end of a half hour and the readings made. "A positive reaction consists of a raised white elevation or urticarial wheel surrounding the cut. The smallest reaction that we call positive must measure 5-10 of a centimeter in diameter. All larger reactions are noted by a series of plus marks, and any smaller reaction is called doubtful." False skin reactions as evidenced by reaction to all proteids are due to an irritability of the skin, and may at other times be absent. Occasionally a patient may be sensitive to a proteid which apparently is not the cause of the asthmatic attacks. A woman who was sensitive to the proteid of cornmeal and staphylococci pyogenes aureus never ate cornmeal, and treatment with vaccine of the staphylococci relieved the bronchial asthma for many months; then the attacks reappeared worse than ever. Treatment with the vaccines, however, brought no benefit. On account of the conservation of wheat flour during the war, this woman had to eat substitutes, and she was eating cornmeal bread freely without thinking about the positive skin test with that proteid. On being reminded of that positive skin test she omitted corn meal from her diet, and

the attacks of bronchial asthma stopped and have not returned." There may be patients with positive tests who are able to eat moderately of that particular proteid, but where over-indulgence results in asthmatic attacks. Again, omission of a particular proteid from the diet may result in a change from a positive to a negative reaction. The proteids recommended for routine tests are the following: Horse hair or dandruff; cat hair; feathers; the pollens of timothy, red top and rag weed; staphylococcus, streptococcus hemolyticus and viridans, pneumococcus No. 1 and No. 4, and diphtheroid bacillus, and common foods, such as eggs, milk, cereals, meats, chicken, potatoes and other food that the patient may eat frequently.

The proteids causing asthma enter the body through inhalation, ingestion, absorption and infection. Inhalation concerns protein in pollen of plants, in the emanations and hair of animals, in the flour of grains and in organic dust; ingestion, the proteids in the gastrointestinal tract; absorption, the conjunctiva and skin; and infection, the presence of pathogenic bacteria in the body, including foci of infection located in teeth, tonsils, nose, throat and lungs.

Classification of Causes of Bronchial Asthma. Among cases of bronchial asthma of Walker's occurring throughout the year: 100, or 16%, were sensitive to proteids of animal emanations, 57 to horse hair or dandruff; 6 to cat hair alone, 3 to feathers alone, 3 to cattle hair, and 31 patients were sensitive to horse hair in conjunction with hair of dogs or some other type of animal. The horse is, therefore of animals, the most frequent cause of bronchial asthma, the dog the least common cause.

Seventy-four patients, or 12%, of the total cases studied by Walker were sensitive to food proteids, of these 36 patients were sensitive to cereal grains and 38 to food proteids. Of the cereal grains wheat showed the highest percentage affecting 25; corn 3; rice 2. Of the food proteids eggs showed the highest percentage, affecting 16, milk 5, fish 9, and potatoes 8. Occasionally a patient was found sensitive to chicken, beef, lamb, pork, etc.

Bacterial proteids: Sixty patients, or 10%, were sensitive to bacterial proteids; in the order of frequency staphylococcus appeared first, streptococcus haemolyticus second, viridans fourth.

Sixty-six patients, or 11%, showed a positive test to the pollen proteid. Of these the largest percentage was due to the ragweed, and a smaller percentage to timothy and red-top.

Age of Onset of Asthma: "Stated briefly, 4-5 of the patients who began asthma during infancy were sensitive to proteins, 2-3 who

began during childhood were sensitive, and 1-2 of those beginning asthma during young adult life were sensitive. 1-4 of those beginning asthmas during adult life were sensitive, and none were sensitive that began asthma after the age of fifty." Occupation may bear a definite relation to asthma after forty years of age. For example, after forty years of age, four bakers were sensitive to wheat proteid, one hostler to horse dandruff proteid, one sifter of green coffee to green coffee proteid, one jewel polisher to box wood proteid, another jewel polisher to orange wood proteid. In the two latter instances box wood and orange wood were used in polishing the jewelry. Eczema is a frequent complication of asthma in young individuals. Blackfan states that when there is a difficulty in children in the taking of foods on account of urticaria, oedema and asthma there is nearly always a history of eczema.

Prognosis: The prognosis is generally good with the sensitive cases. If the patient has no complicating bronchitis or emphysema, with the non-sensitive cases, the older the patient and the longer the disease has persisted when treatment is begun the poorer the prognosis.

Treatment: In the asthmatic bronchitic type of drugs, the iodides in 10 gr. doses, for thinning the sputum adrenalin 5-10 to 1 cubic centimeter, atropin in large doses and fumes from stramonium leaves and salt petre; in the non-sensitive cases autogenous vaccines made from large quantities of sputum relieve these attacks in about 2-3 of the cases. In the sensitive cases relief can be obtained by desensitization, that is boys by giving very small quantities of proteid hypodermatically dissolved in 1-100 normal sodium hydroxide solution, and gradually increasing the dosage or by omitting the proteid cause of asthma from the food. In certain cases change in the preparation of the food will eliminate asthmatic attacks; for instance, where potato is the offending proteid, a baked potato may not be productive of an attack, while a boiled potato may cause symptoms. Where raw milk will cause an attack none may follow the use of boiled milk. Where wheat is the offending proteid, toasted bread or shredded wheat biscuit may prevent attacks.

As to Operations: Operations will not benefit the sensitive cases whereas in the bronchitic cases operations on the nose and sinuses are of benefit only as they favor better drainage and relieve obstruction in the air passages. Diseased tonsils, adenoids and nasal spurs should be removed, and the dentistry should be carefully looked after. Babcock reports a case of asthma relieved following the removal of an infected gall bladder.

Climate: Changes of climate benefit the sensitive cases only when the patients are removed from the locality where the pollens prevail. It is with the non-sensitive or bronchitic type though that a change of climate, say to Florida, Arizona or California, results in most benefit.

DISCUSSION

Philip F. Barbour: My interest in anaphylaxis dates back to my experience on the steamer coming home from Europe. The surgeon on the boat, had taken a dose of 500 units of diphtheria antitoxin to immunize himself against this disease and after this dose had one of the most severe cases of anaphylactic reactions that I have ever seen. He had urticarial wheals all over his body, some of them larger than the palm of my two hands, and the very rapid heart action and his fear of dissolution and his mental depression have made me from that day to this have a great respect for anaphylaxis, and I have been loath to use sera unless I have positive indications for its administration. Since that experience, about twelve years ago, we have had more knowledge of anaphylaxis and there has been an increasing recognition of anaphylactic reaction and parenteral infection. We see evidences of this reaction not only from ordinary proteids but from various other substances, such as drugs, hair, feathers, etc.

I was talking to a colleague, the other day, who told me of a man whom he was treating for asthma, and he was unable to determine the cause, but after finding out that he was sensitive to feathers, he found that he had been sleeping on a feather pillow. As soon as this was removed, the asthmatic attacks disappeared. Some patients are sensitive to the odor of the fine hair from horses, and the contact with cats. The adult comes in contact with a greater variety of causes of sensitization than the child because of its limited range of food.

We are always interested in determining how sensitization can occur. With children, it seems that the very tender mucous membrane of the bowel, and the various infections which take place in the bowel in young children, show some area for absorption of the proteids, so that there is a distinct parenteral infection at his point. Sometimes, we observe in children, in whom we have difficulty in getting a food to agree with them, that they will take the food for ten days or two weeks, and then the upset occurs.

I remember hearing various men in London, speaking of the relationship between eczema in babyhood and asthma in young children. If the eczema started at a very early age, the range of causative agents is narrowed to a very few. In the majority of cases, this has been found to be a fat intolerance. Technically speaking, only a proteid can cause anaphylaxis, but it is not pos-

sible that our concept must be widened to take in intolerance of any type of food?

Desensitization by the method of Besredke is very effectual, but the period of anaphylaxis is much shorter than the sensitization period and therefore cases, such as hay fever, must be treated repeatedly in order to get relief because the stage of sensitiveness is persistent.

Cuthbert Thompson: Dr. Baldauf has given us a very good synopsis of Dr. Chandler Walker's paper on bronchial asthma and the differential diagnosis between typical cases of this condition and asthmatic bronchitis; but there are many atypical cases in which the differentiation is not so easy, especially is this true of cases in children subject to colds and bronchitis and who later develop asthma.

I am especially interested in Dr. Barbour's description of asthma as it is seen in children. He will recall a family in which the mother suffers from asthma and attacks of migraine, and her four children have all suffered from eczema and urticaria, she herself having suffered from eczema when a child. One of these children now has asthma and has been found to be sensitive to three different food proteins, and it is very difficult to prevent the patient from eating some of these at times and precipitating an attack of asthma.

Gavin Fulton: I know of no one thing that causes more anxiety and more general worry to the doctor than cases of eczema with or without asthma. I have had more trouble with this class of cases than any other type that has occurred in my experience for many years.

Speaking from my own experience I think it is difficult to determine the form of protein or the type of bacterium that is responsible for the production of asthma in all cases. Dr. Barbour's remarks concerning the relationship between asthma and eczema are interesting. I recall three cases which may be worthy of record in this connection.

The first was a boy now ten years of age. When I first saw him he was six months old with the most intractable eczema of the weeping type that I have ever seen. There was not a spot on his face which was not involved. He was very ill and fretful when I saw him and was losing weight constantly. The mother's milk had been analyzed and found normal. The child had no other food. The eczema had existed for some time when I was called to see the baby. In those days we knew little about the effect of foreign proteins, anaphylactic reactions, etc., but I could see nothing else to do but to take the child away from the breast. He was given cream cow's milk, and barley water, and immediately began to improve. Within four months the eczema had entirely disappeared, the child was perfectly well and could eat cereals without caus-

ing any trouble. He had no asthma at any time.

The second case was a child twenty months old whose parents have recently moved to the city. The child was perfectly normal in growth and development. The mother stated that four months ago the baby suddenly began to wheeze slightly and had some cough, description of the onset corresponding to that given by Dr. Baldauf. Within two weeks an eruption appeared on the face, arms and buttocks which did not spread very rapidly. At the time I saw this child the mother was giving it no cereals, nothing but skimmed milk, fruit juices, etc. Chicken broth was allowed once a day. I did not ascertain what particular protein caused the trouble. I discontinued the diet mentioned and gave the child my favorite combination, viz., cultured milk with karo syrup. This diet has been given now for two weeks and the child has improved markedly, he is breathing normally, and there is very little evidence of eczema remaining.

The third case is a boy, aged eleven years, who has had some gastro-enteric disturbance all his life so far as I know. At any rate he has never been in robust health and his mother has always been very anxious about him. This child has never had eczema, but last winter became ill with what appeared at first to be pharyngitis; within seventy-two hours bronchitis developed. He had moist rales over the chest, frothy expectoration, but no elevation of temperature. The attack lasted for three weeks. In the meantime at night he had rather severe attacks of asthma. His diet has been carefully regulated, the intake of protein has been reduced to the minimum, he has been given green vegetables, cooked fruits, skimmed milk, etc., but his asthma has continued. He was given adrenalin and atropine, and at different times seemed to be perfectly well for a few weeks; then another acute attack would supervene, with coughing, labored respiration, some bloody expectoration, and great distress. The attack would last four or five days then subside. The child would then feel perfectly well until another paroxysm occurred.

I think it is difficult to determine the cause in some of these cases.

James W. Leach (Providence, R. I.): I think the most important point in the paper is the one the essayist very properly emphasizes, i. e., the difference between the two types—bronchial asthma and asthmatic bronchitis—the former being anaphylactic and the later bacterial in origin. In my opinion this distinction cannot always be made with certainty.

I recall the case of a woman thirty years of age who had suffered with attacks of asthma for about three years. On examination her tonsils looked suspicious, and upon removing the right tonsil (which was in worse condition than the left) it was found to contain a small amount of

pus, examination of which showed pure staphylococcus aureus. That was seven years ago. There has been no recurrence of her asthmatic attacks.

In another case where the patient had rather frequent asthmatic attacks, there has been perfect relief following exenteration of the ethmoid cells on one side.

I have under observation a woman who has returned at longer or shorter intervals to have nasal polypi removed. During the time a polyp is present she has attacks of asthma, and when the polyp is removed she enjoys comparative freedom from attacks. I think in her case the ethmoid cells should be operated upon, but she has declined to undergo a more serious operation so long as she can obtain comparative comfort from the simpler procedure of removing the polypi.

As regards nasal spurs and septal deviations as the cause of asthma: I think these deformities of themselves are never the cause of asthma, that is to say mechanical obstruction is not the cause. Of course, mechanical obstruction may so interfere with drainage as to permit chronic inflammation, and in that way constitute the underlying factor in the production of asthma; but the removal of the spur itself or the septal deviation will not provide adequate drainage of infected sinuses and will not materially benefit asthmatic attacks.

S. G. Dabney: It used to be said that asthma was one of the most capricious and puzzling diseases with which the physician had to contend, and I think we are beginning to understand some of the reason for this. As the essayist has said, some very remarkable advances have been made in recent years in our understanding of the cause of this disease.

I wish Dr. Baldauf in closing would include some remarks on hay fever, so-called, with or without asthmatic seizures. I would particularly like to know what his experience has been in such cases in regard to treatment.

I would also like him to tell us whether in those occasional cases without asthma, where the patient suffers from nasal obstruction, violent attacks of sneezing, burning and pain in the nose, developing for instances when the patient rides behind a horse, etc.—whether he has been able to produce relief by the vaccine treatment.

I recall one young man in particular, coming under my observation last summer, who has this type of trouble. I worked on his nose for some time and was very much disappointed because so little good was accomplished. I suggested sending him over to Dr. Baldauf to have him try the vaccine treatment, but the patient said he was not bothered very much at that time and thought he would postpone it. I would like Dr. Baldauf to tell us whether that group of cases

have been benefitted even in the absence of asthmatic attacks.

Many years ago, Bosworth, of New York, wrote a great book on diseases of the nose and throat. He took the ground that the vast majority of cases of asthma could be cured by treating the ethmoid cells and the sinuses. I was very much interested in what Dr. Leach said in regard to this feature.

I do not believe nasal spur or deviated nasal septum in itself plays much part in the production of asthma. It is only when obstruction is enough to interfere with drainage of the sinuses that you have sinusitis as a consequence. The sinus trouble that is most productive of asthma is undoubtedly ethmoid disease. This is generally of the type known as polypoid degeneration of the ethmoid in which the polypi are not large, they are usually about the size of grape seed and are embedded in the ethmoid cells, and frequently on first examination of the nasal passages these small polypi are not seen. My own experience has been that a large number of the patients with sinus disease also have asthma.

I was very much interested in the statement that in some cases asthma was relieved by removal of diseased tonsils. I have been a little skeptical about the value of tonsillectomy in such cases, but the next time I see a patient with asthma I am going to remove the tonsils and see if it has any effect. I believe focal infection from the tonsil may be the cause of asthma in certain cases, particularly if there is also disease of the ethmoid cells.

Henry Enos Tuley: This is a very timely paper and Dr. Baldauf has handled the subject in a very scientific and interesting way. I can recall when I first went to New York in 1890, listening to the lectures and clinics of Dr. Page on physical diagnosis, who afterward issued his text-book which is still a standard. His lectures on asthma were prophetic in that he referred to the disease as being due to an abnormally sensitive nerve center, a diseased area of mucous membrane and an external irritation. This theory, which he could not explain, has been borne out by the developments of this newer theory of protein irritation.

I think we have been very prone in the past to discredit the efforts of the proprietary drug manufacturers, but we owe a great deal to them, as they have done much toward the development of the study of various pollens and proteins and to the mechanical isolation of them. If it had not been for these pharmacological investigations, we would not now be in a position to make these various protein isolation tests.

There are many peculiar things in these various protein reactions, an instance being the effect upon bakers, of the different types of wheat flour. The baker at the City Hospital has an attack of what he calls "bakers' asthma," when

he uses spring wheat flour and it has been found that he is sensitive to the cutaneous test of protein of spring wheat flour. The diagnosis from protein tests are oftentimes brilliant and if used properly will undoubtedly clear up many questions.

W. E. Gardner: Dr. Baldauf's paper has incidentally suggested an interesting thought from a neurological standpoint. I am of the opinion that any irritative effect on the vagus nerve which would produce asthma undoubtedly must be through parasympathetic nervous system. Whether it is protein, bacteria or pollen, I think the stimulus is carried to the parasympathetic centers and these centers then send the stimulus back through the vagus nerve to the lung.

I think infectious diseases of the nose, the mechanical effects of suppuration, or even a spur of bone, might produce sufficient irritation through the channels I have mentioned to cause a spasm of the vagus. Bronchitis causes irritation of the mucous membrane of the lung, the stimulus is carried through the autonomic portion of the vagus to the medulla and back through the regular efferent fibres of the nerve and thus produces a spasm. Also irritation of the abdominal viscera, especially the appendix and gall bladder, has the same effect. The stimulus is carried from the medullary portion of the parasympathetic nerves through the vagus to the lung and may thus produce asthmatic attacks.

There is some question in my mind in reference to the connection between eczema and asthma. Does the same anaphylaxis produce asthma and eczema at the same time? Or does the anaphylaxis produce eczema and the eczema produce irritation which is carried into the autonomic nervous system and back through the vagus thus producing asthmatic attacks.

I am convinced that the parasympathetic nervous system is the one that produces the symptoms of asthma in these cases, whether the cause be infections, irritative, traumatic or otherwise.

Leon K. Baldauf (closing): There are so many causes of asthma, and there is so much which has not yet been interpreted, that it is difficult to be definite in discussing this subject.

I had one case similar to the one mentioned by Dr. Tuley, a baker who lives in an adjoining town, has had some very severe attacks of asthma. He said that every time he works in flour he has an attack of asthma, and thought the flour must have something to do with it. For some time he remained out of the bakery and looked after outside business, and during this time he had no asthmatic attacks; but even now, every time he goes into the bakery and gets a whiff of flour, or even when he has to carry a sack of flour, he had a violent attack of asthma. We tested him against wheat and he showed an enormous wheal.

Dr. Barbour said something about protein getting into the system through the intestinal tract. I believe Schloss has shown this to be true in many cases.

As regards bacterial proteins: what we do is this: We first test the patient against food proteins, animal emanations, etc. If we find he is not sensitive to any of these, we then look upon the case as one of asthmatic bronchitis, whether he is sensitive to bacterial proteins or not. We do not make any further tests against proteins but simply make an autogenous vaccine from the sputum.

We do not claim anything original about the making of vaccine, but we believe we get better results by making it in this way: The ordinary sputum in a case of bronchial asthma is rather thin and not very tenacious; but in asthmatic bronchitis, where the patient has definite symptoms, the sputum is thick and tenacious. If you try to make a culture of a small amount of sputum, not sufficient of the bacterial flora will be included to make a satisfactory vaccine. We take a large mass of sputum and put it in a sterile bottle which is placed in the incubator over night. In twenty-four hours the sputum is practically liquid, we then sterilize the top of the bottle and pour a large part of this fluid sputum on the culture, and our vaccine then includes the maximum bacterial content and the protein which collects in the bronchi. We have found that cases of asthmatic bronchitis are wonderfully benefitted by the administration of vaccine prepared in this manner. I believe the results obtained in the treatment of asthmatic bronchitis from the use of vaccine made from the sputum as I have described are the most remarkable that I have seen in vaccine therapy.

Babcock, before the Mississippi Valley Medical Association three years ago, reported thirty of forty cases of asthmatic bronchitis in which he used autogenous vaccine with the most wonderful results. If the vaccine is correctly prepared and properly used good results may be expected in over two-thirds of cases. Of course, if sinus disease is present or the tonsils are diseased—and it has been shown that asthmatic bronchitis is often due to these causes—the sinus should be drained and the tonsils removed, then prepare vaccine from the sputum and when properly used wonderful results will be secured.

In regard to desensitizing the patient against the various proteins: I have not had very much experience with the pollens or with desensitizing against protein. It is a long and tedious procedure to get desensitization. Desensitization against the pollens is seldom necessary in the city, but oftentimes necessary where people live in the country. Desensitization is a rather dangerous procedure sometimes and should be done by someone who has had experience.

Of course, this discussion raises the whole ques-

tion of hay fever, or vasomotor rhinitis. These hay fever cases are always sensitive to some form of protein. This may be food protein, animal emanations, bacterial protein, the pollens, etc. I suppose the difference between the two diseases, asthma, and vasomotor rhinitis, would be merely the difference in the clinical symptoms. In fact, it is not uncommon for asthmatic patients to also have hay fever. This was true in one of the cases I have mentioned.

In the paper I stated that in Walker's series of cases, he makes mention of the percentage sensitive to the proteins of animal emanations, horse hair, dandruff, cat hair, feathers, cattle hair, wheat, corn rice, eggs milk, potatoes, the various meats bacterial proteins and pollens. I am aware of a number of patients who have an attack of bronchial asthma every time they ride behind horses.

So far as treatment is concerned: My experience has been principally along the lines of vaccine administration. I have seen more cases of asthmatic bronchitis than I have of bronchial asthma. I remember one girl who had asthma for a number of years. She had an attack on the average of once per week. She was given autogenous vaccine and did not have another attack for four months. Sometimes after the administration of vaccine there are no further attacks for five or six months. The thing to do is to prepare fresh autogenous vaccine after each subsequent attack because the bacterial flora may be entirely different from that present during the previous attacks.

Vaccine treatment of asthma represents one of the greatest advances in therapeutics during recent years and there have been some very wonderful results reported.

Sydenham and Epidemic Encephalitis.—Cardinal quotes from Sydenham's "Practice of Medicine" an account of an epidemic fever, 1673 to 1675, which seems to be identical with the present epidemic encephalitis. He kept the patients from lying down, fearing the congestion of the brain therefrom, and he described persisting hiccup as forming part of the clinical picture. He refers to mild nervous sequelae of the disease as continuing for some time, but disappearing as strength was regained.

The Intermediate Carbohydrate Metabolism.—Stepp and Lauge write from Voit's service to describe the finding of volatile substances in the urine of a number of diabetics, these substances reducing Fehling's solution. They seem to be of an aldehyd nature. The tests applied showed it to be acetaldehyd. It occurred always associated with acetone and acetic acid in the urine.

PRE-NATAL CLINIC OF THE LOUISVILLE CITY HOSPITAL.*

By ALICE N. PICKETT, Louisville.

When Dr. Barbour asked me to make this talk it was gratifying to me to realize that I had been asked by a pediatrician rather than by an obstetrician, for I felt that he must regard pre-natal work as a means of building a stronger, saner race and not as one of the fads of modern obstetrics.

I would like to tell you of the pre-natal work done at the Louisville City Hospital, not because the work itself is different from that which most of you are doing in your private practice, but because it has been done in a big city hospital as a public health measure.

For the encouragement of those of you who are trying to work along these lines I would like to tell you first of our difficulties. Our city hospital, for all it looks so splendid and big, is hard put to it for clinic space. Our pre-natal patients must enter the hospital with the daily throngs of other out-department patients. They must wait in a common waiting room, common to men and women of both races. We have one big room divided off by curtains for our history taking, our examinations and our dressing rooms. More than that our hospital is a teaching hospital and the presence of students at these clinics makes pre-natal work distinctly more trying for the expectant mother. In spite of these handicaps our results have proved that we are meeting a real need and that a pre-natal clinic can be made a great asset to the community.

During the twelve months just before we began this work there were delivered in the City Hospital only 250 women. During the past eleven months 388 women have gone through the clinics; 765 visits to the clinics have been made and we have averaged 3 home deliveries a month. I am sorry I cannot tell you what percentage of women delivered in the hospital have been clinic patients. Our statistics along this line have not been well kept. I do remember, however, that at one time out of the 30 patients in the wards 26 were clinic patients, and at another time 17 out of 21 patients had been registered in our clinic.

We have accomplished this work through the help of our personnel and the quite unusual cooperation of associated agencies. Dr. Tuley of our Hospital has given his unfailing assistance and sympathetic support. Dr. Speidel professor of obstetrics in the Uni-

versity, has been our able and willing consultant on all interesting cases. The District Nurses Association, with its corps of pre-natal nurses, milk fund nurses, school nurses, etc., has induced the patient to come in and has seen to it that they report at proper intervals. The Social Service force of the city and especially that group attached to the hospital has been invaluable. The Salvation Army has sent us all of the pregnant women for examination and we have not scorned the patronage of the Juvenile and Criminal courts.

The personnel of the clinic consists of a Social Service nurse who acts as our secretary; a hospital nurse, the resident on obstetrical duty and a clinician. Dr. Speidel has acted as our consultant. Our figures show that the clinic is a growing success, but the attitude of the women toward the work is still more gratifying. The workers have all been courteous and kind, and I believe the patients feel that they have in us real friends who are able to make pregnancy for them safer and less of a burden. More than that, we have tried to accent the dignity and beauty of motherhood. By our willing and constant service we have made them feel that we are honest when we say "a good mother is the nation's greatest asset." Nothing is too much trouble for us to do that contributes to their safety. Because of our sincerity and earnestness in the matter of their well-being they become the more willing to follow our instructions to the letter.

Our routine is as follows: The secretary takes the history of the patient's previous health, with especial attention to her previous pregnancies and deliveries. A general physical examination is made, the heart is examined and the blood pressure taken. When the history or the physical findings point to pulmonary trouble the patient is taken at once to our anti-tuberculosis department and Dr. Miller makes a careful chest examination, giving us his report and his advice as to the handling of the case. The pelvic measurements are next taken, the foetus mapped out and the foetal heart located. The height of the fundus is also recorded. At the close of this initial examination we make a bi-manual pelvic examination recording the conformity of the arch, the approximation of the spine, the position of the presenting part and the length of the diagonal conjugate. We also commit ourselves on paper to a provisional diagnosis as to the course of delivery. In each case a cervical and urethral smear are taken and a specimen of blood sent to the laboratory for Wassermann test. At the subsequent examination we make a blood pressure record, outline

*Read before the Kentucky State Medical Association. Lexington, September 27, 28, 29, 30, 1920.

the foetus, measure the height of the fundus, regard the position of the foetal heart and send a specimen of urine to the laboratory. At all examinations we make a record as to headache, oedema, dizziness, faulty vision, epigastric distress, constipation, bleeding, etc. When the laboratory reports a smear positive for gonorrhoea or a positive Wassermann the patient is referred to the G. U. department where she is at once put under specific treatment.

The general health is maintained either in the home under the care of a district nurse, or, when this is impossible, on the ward of our hospital.

Our results have been on the whole very good. We have been able to anticipate difficult deliveries and diagnose multiple pregnancies and faulty positions. We have had one Caesarean section which was rendered necessary by a flat pelvis. This operation was done without pelvic examination at the time of labor, since we had gotten all the necessary information weeks before in our clinic. It is not necessary to say that the patient made an uneventful recovery. Some of you perhaps saw Dr. Louis Frank operate on one of our patients during our clinic week for ruptured tubal pregnancy. During the eleven months we have been fortunate enough not to have a single case of grave toxemia develop among our pre-natal patients. We consider a lift in blood pressure a very early and sure sign of developing toxemia; an earlier sign than the urinalysis affords. The pressure of normal pregnancy is about 120, or below, when it rises to 130 we put a patient on a routine whether she has any other symptoms of toxæmia or not. This routine is very simple and we are usually able to carry it out at home. It consists of a simple diet, low in proteins, and free elimination by the bowels induced by daily saline laxative. The definite directions are: "No meat, no eggs, no cheese, no brown beans and a dose of salts every morning." The patient reports frequently and if the pressure does not quickly return to normal we admit her to the House.

Last summer when I was at the New York Lying-In I was surprised to find that they did no routine Wassermann or cervical smear examination. These examinations were only made "when indicated." I believe our routine is much better. I feel sure that by our specific treatment we have often avoided abortion, and surely we must have prevented death of the foetus in utero, to say nothing of miscarriages and premature deliveries.

I do not believe we should wait for a significant history or the physical signs of syphilis before doing a Wassermann test. How often have we seen the pregnancy of an ap-

parently normal woman terminate in abortion or the death of the foetus because of syphilis. On the other hand we have learned much from the emergency cases coming into the hospital in labor who have had no previous pre-natal care. It is our rule that these cases have a Wassermann test before leaving the hospital. Quite often it has happened that a woman who has given birth to an apparently normal baby has shown a 4 plus Wassermann. If this woman is treated at once we can often prevent the appearance of the disease in the child, and, what is more important, we may prevent those cases of arrested mental development, general physical debility, neurasthenia, etc., which later in adult life present so obscure a picture. The record of the routine Wassermann examination in our Children's Hospital has been a sad testimonial to the wisdom of the routine Wassermann in pregnancy. If our pre-natal work accomplished nothing more than to lessen the burden of inherited syphilis for our children and our race, it would still be quite worth while.

CASE OF MENINGITIS.*

By SAMUEL G. DABNEY, Louisville.

Two weeks ago a trained nurse telephoned me asking me to go and see her sister as soon as I could. It was then about noon and I told her I would be there about two-thirty. When I reached the house I found the patient, a woman aged about sixty years, in maniacal delirium. She was being held in bed by her sisters, the trained nurse already mentioned and another sister.

The history of the case was very indefinite—the patient had been able to walk about the house the day before. She had complained of pain in her ear for two or three days. Delirium had developed that morning about seven o'clock and had continued since then. It was impossible to ask her any questions as she was entirely beside herself. Examination of the ear showed a slight discharge. So far as I could determine there was no tenderness over the mastoid region, there was no redness of the skin and no sagging of the upper posterior portion of the drum membrane.

I expressed the opinion to her sister that she probably had an attack of meningitis, or possibly an uremic condition. I told her I thought it would be best to have a lumbar puncture made as I thought she had meningitis, and that urinalysis should also be made. As a matter of routine I concluded to enlarge the opening in the drum membrane.

*Clinical Report before the Louisville Medico-Chirurgical Society

Her sister asked Dr. Allen to make the lumbar puncture. The woman's delirium was so great and she was so restless and difficult to control, that it was necessary to give her an anesthetic. I made a free incision in the drum membrane to see whether there was any further evidence of infection, intending, of course, to take a sample of pus, if any was found, for culture to determine what the organism was; but there was so little discharge I did not do this.

As soon as Dr. Allen withdrew some of the cerebro-spinal fluid, he remarked that the patient had meningitis; the fluid was milky in color. Specimens of the spinal fluid and urine were taken for examination.

Dr. Allen telephoned me next day that he found pneumococci in the spinal fluid, and that the urine was loaded with albumin and tube casts. The patient died two days later without ever regaining consciousness.

It seems to me from the spinal fluid examination that it was a case of meningitis. The woman's temperature was only slightly above normal. My guess is that in this case the infection extended upward through the middle ear into the brain directly without any mastoid involvement.

Dr. Louis Frank will recall a somewhat similar case which we saw several years ago. The patient (a physician) was brought to Louisville in an unconscious state and was seen by the late Dr. Ap Morgan Vance, Dr. Frank, the late Dr. J. B. Marvin, and myself. I found the upper portion of his drum membrane pushed outward and there was a slight discharge from the ear. He had complained of intense, sharp, stabbing pain in that ear. I made the tentative diagnosis of meningitis from the extension of the ear infection, and Dr. Frank agreed with me, but some of the other gentlemen disagreed.

The patient died very promptly and at autopsy we found, just as we had suspected, a small ulceration through the roof of the tympanic cavity and it was in this way that the brain had become infected.

I think both these cases are interesting, as they are unusual.

DISCUSSION.

S. Shelton Watkins: Dr. Dabney's supposition that the pathway of infection from the middle ear to the meninges was through the tegmen tympani or tegmen antri, seems to me to be the most plausible one because it is the most frequent. In view of the absence of definite symptoms of mastoiditis it is quite unlikely that the pathway was through the posterior bony wall of the lateral sinus, which is a not infrequent route. It is possible that the infection reached

the dura through the internal auditory canal, but this is a very rare occurrence.

The rather sudden onset of the meningitis without mastoiditis would suggest that there was a dehiscence of the tegmen tympani or tegmen antri.

We know that very rarely facial paralysis may follow a mild otitis media without involvement of the mastoid, due to a dehiscence of the aqueduct of Fallopius. I saw such a case about a year ago. It is possible that a similar condition involving the roof of the middle ear and antrum occurred in the case reported, but it is, of course, quite improbable.

As said before, the most logical explanation is the one given by Dr. Dabney. However, the rapid progress of the infection makes one suspect an unusual cause.

J. R. Peabody: Fortunately cases of the character reported by Dr. Dabney are rather rare. I have several times called attention to the fact that meningitis is possible from extension of infection from the middle ear. This should be borne in mind especially in connection with acute otitis media of children. Pediatricists who first see these cases do not seem to appreciate the danger of meningitis in cases of otitis media, and do not often call an ear specialists in consultation.

In the case Dr. Dabney has reported the drum membrane was incised promptly, yet meningitis developed as a complication. I believe it is possible for infection to occur through the lymphatic channels in cases of this kind, the infective material being carried direct to the meninges from the middle ear. I doubt if this was true, however, in the case reported.

There have been recorded several cases similar to the one reported by Dr. Dabney, where intervention—opening of the drum—has been done at the proper time, still the patient developed fatal meningitis without very much discharge from the middle ear.

J. G. Sherrill: I would like to ask Dr. Dabney to state if he can the probability of benefit resulting from opening the skull in cases of this type, that is acute meningitis. My experience has been that operation has not been satisfactory in such cases, and if he can give us some statistics on that point it would be interesting, because if anything can be done it would be by prompt drainage of the cranial cavity; but in my experience the results have not been very satisfactory.

S. G. Dabney (closing): I think Dr. Sherrill's experience in opening the skull for the relief of meningitis is about in line with the common belief. The prognosis in suppurative meningitis is always bad. Operation has proven futile in the majority of instances.

As regards bony dehiscence, it is far more common in young children in whom the bony parts may not have united.

The clinical history in the case reported would hardly make us think of septic thrombosis. The woman's temperature was never high although she was delirious for a number of hours. She rapidly became comatose and died without regaining consciousness. The indications point to direct extension of the infection to the meninges from the middle ear.

The chief points of interest in the case are: the suddenness of the symptoms; their marked severity, and the promptness with which dissolution occurred.

SOME IMPORTANT CONSIDERATIONS IN ESTABLISHING A FULL TIME HEALTH DEPARTMENT PERMANENTLY.*

By RALPH J. MALLOTT, Health Officer, Harlan County, Harlan.

It should hardly be necessary to specify "full time" in connection with the health department you wish to establish permanently because in order to insure permanency it is absolutely necessary that the members of the health department put in all their time and then some. Health work is readily comparable to other businesses for while the requirements of its work include scientific and ethical medicine and a trained physician to administer this part of the work they also include a great deal of work which must be conducted along strictly business lines.

Probably the primary consideration of any health department is the rules and regulations to govern the conduct of the department. Very fortunately in our State of Kentucky we are blessed with an adequate and scientific set of rules and regulations, framed by Dr. J. N. McCormack and his able assistants and promulgated by the State Board of Health of Kentucky and enacted into laws of our State by progressive legislators. As a consequence when establishing public health work in this State we find that we already have rules and laws to govern the various phases of the work, most of which have been tested out in the courts. This is particularly important because the people wish to be assured that the public health work as it affects them also affects every other inhabitant of the community in exactly the same way. Once they are convinced that this is the case the majority of the citizens enter into all the efforts for the common good with considerable enthusiasm. I have frequently been told in my county, by men, that they are strongly in favor of all work tending toward better health and better

living conditions provided it takes in rich and poor alike.

If I may borrow simile from the foot-ball field I can illustrate the important factors going to make a permanent health organization with perhaps greater clarity. Take the "old flying wedge" which was such a ground gainer for some of our big teams in the past and posing factors for men, we have a wedge composed of first, legal enforcement; second, staff; third, public opinion, with the health officer or director as quarter-back; and like the foot-ball wedge this triangle is of value only as its component parts are directed simultaneously toward a given goal. Taking as our goal, accomplished public health work in our community and converging these elements of the wedge toward this goal, we carry out this figure of speech.

Working on this basis it is just as important that each element in the wedge be impelled forward in its proper relation to the whole, as it is to have well picked men for the foot-ball strategy.

Something has already been said concerning the rules of the game, which are for us very fortunately enacted so that all who run may read. Deviation from these rules will precipitate more trouble in a shorter time than any other one of the elements because people are quick to understand fair dealing and fair play even though its measures may be strict on them personally and they are just as quick to note and remark upon any discrepancies in the administration of those rules. Hence it is vitally necessary for the work that such law enforcement as is necessary to promote the work be actually fair and above board. Dealing one way with one case and another way with a similar one undermines the efficiency of a health department and affects its future adversely. It may seem that too much stress is laid on this point because, after all the health department is not a law making nor a law enforcing organization primarily and its biggest field for good lies in the education of its people. However, in order to make the best progress with the educational work it is absolutely essential that the health department and all members of its staff have the complete confidence of all the people and quite frequently it is by comparatively minor decisions or actions on the part of the staff members in matters where these rules govern that this confidence is impaired and occasionally entirely destroyed. A health department conducted without the confidence and cooperation of its people is no health department at all and the educational seeds which it scatters will fall on barren ground.

It is with the foregoing in mind that we take

*Read at the conference of County and City Health Officers, Louisville.

up the second component of our wedge, the staff, and examine the necessary qualifications for it. A health department staff may be large or small but unless there is complete accord among the members and a common understanding of the work to be done and of the methods of doing it there is trouble ahead for that department and unless such errors in harmony of the staff are properly corrected and good will and mutual understanding exist, the people at large soon become acquainted with this fact and thereby lose some of their confidence in the department, which in turn materially interferes with the work which that department can accomplish. Quite often one member of a staff can demoralize the whole organization and it is just as important to eliminate that member as it is to take a rotten apple out of a basket of good ones if you expect to save the rest of them. It is natural that the larger the staff becomes, the more difficult it is to insure a smooth working organization but this point deserves considerable emphasis and should be attended to with the greatest care if permanency is to be expected. In building up such a staff the tenure of their positions govern to a large extent the kind of work which may be expected and where continued positions are assured permanence of both staff members and of the work in general is much more easily attained. Good salaries should be paid because in health work, as in any other work, you cannot get something for nothing. While there may be individuals who are philanthropically inclined and will do social service work for less money than they could obtain for other work it is not fair nor good business to either the individual or the work to offer remuneration which is too small for the services rendered. Health work in the community pays in a financial way as well as in other ways and if it is not paying there is something wrong with the way it is being done; if it is paying, the laborer is worthy of his hire, and that should be an amount equal to that he would receive from the same endeavors in other fields of work.

As has been previously mentioned the first two elements of the wedge have a direct bearing upon public opinion concerning the work and if that opinion is favorable it indicates that the other two elements are exerting their proper force. Public opinion is the strongest animal known. It will change color faster than a one-horse circus zebra in the rain, and like that animal it has its mulish instincts. It cannot be driven and unless you know how it cannot be led.

Here, particularly, the director must be on the job, check any erroneous ideas, more especially to promote the proper ideas. In

our simile the director is the quarter-back and he must know his men and what they can do; what plays to use to advance the ball the farthest. The director's duties are multifarious and are likely to include anything from instruction to mothers about nursing babies down to smoothing out neighborhood quarrels over sewage conditions and from planning ways and means for combating communicable diseases in his locality to conferring with willing workers on large sanitation projects. As in foot-ball the spectacular plays are what the grandstand likes to see but they are not the most important way of gaining the goal. It is the steady plunging, the continuous line drives which roll up the largest scores. In public health work it is the consistent and continuous, steady effort which produces the most permanent and satisfactory results. Public health work is coming into its own because it is filling a need that is now being recognized generally. Just in proportion as it fills this need efficiently will be its permanency. No factors tending to this end should be too small to overlook, nor should the great factors be handled in a careless or haphazard way. Much of the future work depends for its permanence upon the action and success of the workers of the present generation. I have touched only on fundamental considerations. The phases and ramifications of these elements I have mentioned constitute the ground work of establishing public health work permanently. It should always be borne in mind that it is the daily routine of the minor details and the way in which they are handled which do the most for a public health department. There are but few workers in the health field probably who do not give sufficient time and attention to the big problems which arise to put them over successfully but in the County Work big decisions are not frequent and it is absolutely necessary that the details receive the same careful consideration one would give the larger items. Careful handling of the people will change your public opinion more easily than any other one thing; educational efforts, such as bulletins, letters, newspaper articles, and lectures promote your public opinion. And the most fruitful field for developing this factor lies in the schools, where the proper ideas regarding public health can be implanted to yield cooperation in the years to come. Witness in this connection the marvelous results obtained by this means in tuberculosis, where the educational seeds of twenty years ago have now commenced to yield their fruits in a greatly lessened death rate from this disease. Adverse criticism on local conditions and suggestions for improvement should be made in as kindly manner as is consistent with firmness. Adhere to your

rules of the game closely. Remember the Golden Rule and act accordingly and your public opinion will precede you opening the way for your work. It is all much easier to say than to do because the practical exigencies of your local situation will constantly keep you studying to know just which rule to apply and just how it should be applied.

In closing may I call your attention again to the fact that permanency in establishing a health department depends not so much upon any outline of work you may provide but rather on the sincerity with which the work is conducted; upon consistent and efficient efforts toward a certain goal; upon the education of the citizens of your community regarding the vital necessity of public health work. Watch these elements and you will have biltled for future time.

NEWS ITEMS AND COMMENTS

PRELIMINARY PROGRAM OF THE MISSISSIPPI VALLEY MEDICAL ASSOCIATION.

The Mississippi Valley Medical Association will hold its annual meeting at the Statler Hotel (Roof Garden), St. Louis, Mo., Thursday, Friday and Saturday, October 13, 14, and 15, 1921.

Two days of Clinical presentations by leaders in the various specialties. One day of clinics.

Clinical discussions and illustrated demonstrations of borderline medical subjects, by a group of distinguished clinicians.

Each member on the Scientific program to be an address instead of the usual paper.

Friday Evening—8 P. M.—Public Meeting

Oration in Medicine, "The Irregular Practice of Medicine," by Dr. Llewellys F. Barker, Baltimore, Md.

Oration in Surgery, "Cancer; Its Prevention and Etiology," Dr. Albert J. Ochsner, Chicago, Ill.

Thursday Morning—9 A. M.

"The Surgical Management of Toxic Goiters," Dr. John de J. Pemberton, Rochester, Minn.

"Some Diseases with Increased Movements—Dystonias," Dr. Lewis J. Pollock, Chicago, Ill.

"Dermatology and Its Relation to General Medicine during the Last Half Century," Dr. Wm. T. Corlett, Cleveland, Ohio.

Thursday Afternoon—2 P. M.

"The Early Signs of Pernicious Anemia as Seen from the Neurological Standpoint," Dr. A. S. Hamilton, Minneapolis, Minn.

"Treatment of Congenital Club Foot," Dr. Albert H. Frieberg, Cincinnati, Ohio.

"Some Phases of Genito-Urinary Surgery in Children," Dr. Herman L. Kretschmer, Chicago, Ill.

"Roentgenography in Obstetrics and Gynecology," Dr. Reuben Peterson, Ann Arbor, Mich.

Thursday Evening—8 P. M.

Social and Entertainment (St. Louis Centennial Celebration)

Friday Morning—9 A. M.

"Liver and Biliary Tract Diseases from the Standpoint of the Newer Advances in Diagnosis and Therapeutics," Dr. Frank Smithers, Chicago.

"The Problems of Intracranial Surgery Relative to Brain Tumor," Dr. Charles H. Frazier, Philadelphia, Pa.

"Diagnosis of Abdominal Conditions in Young Childhood," Dr. Henry Hehnholz, Rochester, Minn.

Friday Afternoon—2 P. M.

"The Incidence of Infection in the Production of Stomach and Intestinal Symptoms. Illustrated Instances of Proven Cases," Dr. Anthony Bassler, New York, N. Y.

"Dilatation of the Colon in Young Childhood," Dr. Isaac Abt, Chicago, Ill.

"Arthroplasty," Dr. W. S. Baer, Baltimore, Md.

"Value of Radium in Malignant Diseases of Bladder and Prostate," Dr. J. T. Geraghty, Baltimore, Md.

"The Treatment of Fibroids of the Uterus," Dr. C. Jefferson Miller, New Orleans, La.

Saturday, October 15—Day of Clinics

Clinics will be held, as per printed schedule obtainable at registration desk, at the various St. Louis Hospitals and Universities.

St. Louis University, Medical School Washington University, Medical Department Barnes Hospital, St. John's Hospital, St. Luke's Hospital, Deaconess Hospital, St. Anthony's Hospital, St. Mary's Hospital, Mullanphy Hospital, City Hospital, Missouri Baptist Hospital, St. Anne's Hospital, Children's Hospital.

SOUTHERN SOCIETY OF ANESTHETISTS.

Plans are under way for the organization in Hot Springs during the Southern Medical Society meeting of a Southern Society of Anesthetists to meet annually in conjunction with the Southern Medical. The need of a society devoted to this rapidly growing and now definitely recognized specialty has been felt in the South, especially since other sections of the country are represented by aggressive, wide awake growing organizations like the Interstate Association of Anesthetists, the Midwestern, the American and others.

Anyone interested in such a society is requested to communicate with Dr. W. Hamilton Long, 1922 Deer Park Ave., Louisville, Ky. Organization Secretary.

Kentucky Medical Journal

PUBLISHED MONTHLY BY
THE KENTUCKY MEDICAL ASSOCIATION
Incorporated

Entered as second class matter October 22, 1906 at the Postoffice at Bowling Green, Ky., under act of Congress, March 3, 1879.

Subscription Price\$2.00

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ANNUAL MEETING, PADUCAH, 1922.

COUNTY SOCIETY REPORTS

Daviess—Report of Daviess County Medical Society for 1921 is as follows:

Members reported in good stand last year 53. Of these one died, two moved away and three lapsed, making a loss of 6. To partly overcome that we have taken in 5 new members, leaving 52 to report now.

The members have taken more interest in the society; average attendance being 28.

J. J. RODMAN, Secretary.

Russell—The Russell County Medical Society met at the Miller Hotel, Creelsboro, Monday night, August 9th. Weather being pleasant, the meeting was held in the large porch of the hotel. A few citizens were there. R. M. Armstrong, H. S. Gherkin gave talks, also C. B. Kobert, director of the trachoma clinic and secretary-inspector, who, with his assistants, are inspecting the school children and sanitation in Russell county, gave an interesting talk. After which the meeting adjourned.

J. B. SCHOLL, Secretary.

BOOK REVIEWS

Practical Psychology and Psychiatry: For use in Training School, for Attendants and Nurses and in Medical Classes.—By C. B. Burr, M. D., Medical Director, Oak Grove Hospital for Mental and Nervous Diseases, Member of the American Medico-Psychological Association, etc.

First edition; Revised and enlarged with illustrations. F. A. Davis Company, Publishers. Philadelphia, Pa. Price \$2.00

In the fifth revision important additions have been made to the chapters on Psychology and Forms of Insanity. A new chapter on the Prevention of Insanity has been incorporated. A general comprehensive idea of the subject, as the title implies is given.

Essays on Surgical Subjects—By Sir Berkley Moynihan, K. C. M. G., C. B. Leeds, England. Illustrated. W. B. Saunders Company, Publishers. Philadelphia and London.

This book contains addresses, lectures and essays that have appeared in different journals. Of special interest is the first Murphy memorial oration delivered before the American College of Surgeons at the Montreal meeting.

Idiopathic Purpura.—Two cases of idiopathic purpura are described by Rosenfeld which showed a familial tendency, repeated joint hemorrhages, and association of joint hemorrhages with the symptoms of Henoch's purpura. Spontaneous fracture of the olecranon occurred in one case.

KENTUCKY MEDICAL JOURNAL

BEING THE JOURNAL OF THE KENTUCKY STATE MEDICAL ASSOCIATION

Published Under the Auspices of the Council

VOL. XIX. 

BOWLING GREEN, KY., NOVEMBER, 1921

No. 11

EDITORIAL

THE ANNUAL MEETING

The Seventy-first Annual Meeting of the Kentucky State Medical Association was another of the milestones in medical history of Kentucky to which the profession can constantly point with pride. In many respects, it was the most successful session which has ever been held. The scientific program was excellent. Every essayist on the program was present, read his paper and heard a most interesting discussion of it. As the papers and discussions appear from time to time in the JOURNAL, the members will be delighted with what was particularly a complete cross section of the present scientific trend in modern medicine.

The proceedings of the House of Delegates, which you will find complete in this issue, were full of interest. No previous session has considered and settled so many problems. Every member of the Association should read the proceedings from end to end, and do his part in making effective the action of the Association. It is especially important that all of the members who were not present should share in the determination of those who were, to make the county societies better than they have ever been before. Big plans are in contemplation for coordinating the workings of the State and local organizations so that each will be doing all of its share in helping every member of the profession in all those things that will help him in his work.

It is of especial importance that every county society considers the matter of medical practice within its jurisdiction. The profession in each county must realize its responsibility for the continuation of the profession within its boundary, and it should be interesting the most promising young men in their section in medicine, just as it should be inter-

esting the most promising young women in nursing.

The profession of Louisville and Jefferson County outdid themselves in their notable entertainment. The banquet was a real delight. The appearance of Miss Raymond, the health fairy, who has been flitting from school to school in Kentucky for the past month, was most pleasing to those present, and it was gratifying to see how many, under her genial influence, were able to turn backward time in its flight and become fairly children just for that night. Dr. Hendon is an incomparable toastmaster, and the responses brought forth all the enthusiasm of the guests.

Next year's session will be held at Paducah, and will be guided by one of the strongest councilor and county organizations in the State. Dr. Philip Barbour and Dr. Louis Frank, President-elect, have already begun construction of the scientific program, and they invite the interested physicians of the State to advise them as to how to make it of the greatest value.

The Kentucky State Medical Association is a splendid demonstration of the actual working of a democracy, and the only Kentucky physicians who are not taking a great deal of pride in it and getting a great deal of material aid and comfort from it are the comparative few who are not keeping up with its doings.

THE FRAMINGHAM HEALTH DEMONSTRATION AND INDUSTRIAL MEDICINE.

Framingham, Massachusetts, an industrial city of 16,785 inhabitants, under the inspiration, cooperation and with the material assistance of the Metropolitan Life Insurance Company, has conducted during the last year, and is still conducting, in a most comprehensive, scientific and practical way, one of the most important health demonstrations ever under-

taken in the history of modern health reform. In an address before the Tenth Annual Safety Congress, held at Boston last month, Dr. D. B. Armstrong, Executive Officer of the Framingham Community Health and Tuberculosis Demonstration, who has charge of all the great work above indicated since it began, said:

"The industrial relationships and contacts of the Framingham Community Health and Tuberculosis Demonstration have been extremely important in the development of the Framingham tuberculosis program. These industrial factors constitute the chief consideration of this paper. Perhaps a preliminary word, however, with reference to the character of the demonstration in general may be helpful.

The Framingham experiment, or demonstration, has now been under way for nearly five years, under the auspices of the National Tuberculosis Association, financed by a special contribution of from \$150,000 to \$200,000 to this association from the Metropolitan Life Insurance Company. This demonstration has aimed to answer certain pertinent questions in the tuberculosis field, such as: How much tuberculosis is there? What is the best way to treat it? How best can a community be organized for the eventual control and elimination of the disease? Naturally, the demonstration has had an intense interest in industry, as it is in the industrial age group that the highest tuberculosis death rate are usually found. Certainly, tuberculosis is in part, at least, an industrial disease.

The chief activities of the demonstration were briefly:

1. A general and sanitary survey, including a survey of industrial hazards.
2. Extensive medical examination campaigns, covering a large fraction of all age groups, including industrial workers.
3. An expert consultation service for the diagnosis of tuberculosis, offered to private physicians, factory medical and nursing staffs, etc.
4. The thorough organization of the community itself, not only for tuberculosis control but for general health and disease preventive work, including the fields of general community sanitation, infant hygiene, school hygiene, and industrial hygiene.

Among the most important results of these activities, from the general as well as from the special industrial viewpoint, the following may be mentioned:

1. The examination of a representative population indicates that about 1 per cent. is suffering from active tuberculosis.
2. A thorough search for tuberculosis cases

indicates that there are nine or ten active cases, in an average community, to every annual death from tuberculosis.

3. Adequate medical machinery in schools, factories, and elsewhere is essential to the detection of tuberculosis. A full-time physician for every 2,500 school-children or factory workers is essential. The first consistent medical examination work of the school population of Framingham (about 3,000) disclosed eleven cases of active tuberculosis and sixty-nine suspicious cases hitherto undetected. The establishment of adequate medical machinery in the factories increased the percentage of new cases annually discovered through factory medical machinery from 0 to 27 per cent. over a period of three years.

4. The average community does not report more than 55 per cent. of its active tuberculosis in an early stage. Framingham experience has indicated that this percentage may be raised to 85.

5. The percentage of active tuberculosis cases receiving institutional care has been raised from 13 to 42 per cent.

6. The total health appropriations from both public and private sources have increased from 40 cents to about \$2 per capita per year, the latter figure being set as an approximate standard for adequate community health work.

7. What will adequate machinery accomplish toward tuberculosis control and mortality reduction? Starting with a corrected tuberculosis mortality rate of 121 per hundred thousand as the average for the ten years preceding the demonstration, the rate fell to about one-half of that figure (64 per hundred thousand) in 1920, and present indications forecast a rate possibly in the neighborhood of one-fourth of the pre-demonstration rate for the current year (1921). This would indicate that the same measures, applied throughout the United States, would result in a saving of nearly 100,000 lives a year.

To return to the more important industrial considerations, it may be stated that there are in Framingham, at the outside, approximately 5,000 industrial workers. By far the largest industry, employing approximately one-half of this total, is a paper products plant where tags, boxes, and crepe paper articles are produced. Other industrial interests include carpet manufacturing, boiler construction, foundries, and the manufacture of shoes and automobile bodies.

The demonstration's approach to the solution of the tuberculosis problem has included two main efforts: first, a thorough survey of the industrial hazards of the community carried out with the co-operation of the Massa-

chusetts Board of Labor and Industry, the former New York Museum of Safety, and the New York State Commission on Ventilation, followed by an effort to correct the fundamental dangers to industrial workers; and second, an effort to encourage the local industries themselves, with necessary co-operation and aid at the start, to provide an adequate medical, nursing, clinic and dental service and personnel for the industrial employees.

On the side of personnel, when the work started there were employed by industries in the community one nurse and one part-time safety engineer. As a result of the co-operation which the industrial plants have given the demonstration during the past four years, it is now safe to say that between 70 and 80 per cent. of the industrial workers are under reasonably adequate medical, nursing and clinic supervision. The experience in the largest plant in the community, employing approximately 3,000 workers, is particularly illuminating from the point of view of employee interest in, enthusiasm for, loyalty to, and sympathy with the purpose and objectives of the medical and nursing program. This plant now employs a full-time physician and two nurses, and maintains an excellent clinic and first-aid establishment. The plant is organized on an advanced democratic profit-sharing and management-sharing basis, with considerable participation in control by employees of different grades, through industrial partnership, industrial associates, and shop committee devices.

This relationship between management and employees introduces certain novelties into the development of medical and nursing policies which might have seemed to a short-sighted view, in the beginning, to be obstacles, but which have, in reality, only the more firmly established the foundation for the program as a whole. Take, for instance, the matter of compulsory examination of new employees. It was not impossible to convince the management in this plant of the validity of the employment of its medical and nursing machinery for this purpose. After the management was convinced, however, it was then necessary to convince the shop committee. Fortunately, the expert consultant of the health demonstration, Dr. P. C. Bartlett, has always worked in close co-operation with the members of the medical department in this plant, and, with their help, was able, by effective case histories of individuals ill with dangerous communicable diseases as found in this industry, to illustrate the importance of detecting such affections at the time of initial employment. The principle of compulsory examination was ap-

proved and was put through, with the backing of the management and of the men.

The members of the shop committee, employees in general, and the management, are now enthusiastic over the operation of this rule. It was not long after its application that the men themselves were asking: "If this is good for new employees, why isn't it good for all employees on a regular basis?" In fact, the next step has now been taken, and a system of regular periodic medical examinations for all employees, graded on the basis of age and period of employment, is now being experimented with.

Two or three other clinics with full-time nursing and part-time medical arrangements—in one instance with compulsory examination of new employees—have been developed in the community, and a plan promoted for the provision of a co-operative medical and nursing service for several of the smaller plants unable to provide full-time service for themselves. The actual establishment of this service is now dependent upon the more extensive revival of industrial activities.

While the Framingham experience has been on a relative small scale, it has nevertheless, been an intensive experience and may perhaps be legitimately used to suggest certain tentative standards for industrial medical work at large. It may even be possible to propose certain quantitative as well as qualitative standards. For instance, for an industrial unit of 2,500 people it would seem that there would be required at least one full-time physician and two full-time nurses, an adequate clinic equipment, some provision for dental service and at least part-time arrangements for safety. While the work of the medical and nursing staff may with advantage be organized as a fairly autonomous unit, it should, of course, be very closely related to certain other factory interests, such as the employment management service, the personnel division, the insurance or pension department, educational work, and welfare or recreation activities. Some of the functions of the medical and nursing staff would be:

1. The routine operation of the first-aid facilities and clinic, including the care for minor injuries and ills.
2. The diagnosis of chronic affections, with their reference to outside physicians of the individual's own choosing for continued treatment.
3. General health education by means of literature, lectures, bulletins, etc.
4. General safety work, machine guarding, etc.
5. General plant sanitation, including such

matters as ventilation, cleanliness, water supply, etc.

6. Special class instruction, as, for instance, for groups of girls working on special types of machines, for whom group teaching in personal hygiene may be provided, covering such matters as posture, diet, clothing, and recreation.

7. Particular medical advice with reference to working and living adjustments for department heads and more responsible employees in the managerial class—a sort of local intensified life extension service.

8. The regular examination of all new employees, in co-operation with the employment department.

9. The regular periodic re-examination of permanent employees.

As previously indicated, it is our belief that medical and nursing facilities in industry can only be used to their full advantage if they are developed and operated in close co-operation with the labor groups concerned. These facilities must be used with a primary object of fitting the man to the job, and not as a device for the rigid elimination of the unfit from industry. It must be recognized by all that through the adaptation or, possibly, the elimination of a few will come the protection of many. It is probably unnecessary to say that such medical and nursing provision is a legitimate routine charge upon the industry, is, indeed, a thoroughly profitable investment, and should not be considered at all as a philanthropy which the employer provides for his employees.

Properly organized and promoted, an adequate medical and nursing service in industry will substantially decrease loss to the industry as a result of illness prevented, labor turnover reduced, etc. If the industry is intelligently organized on the basis of purposeful service, with the rational fundamental distribution of authority and responsibility, and with the necessary concomitant participation of workers in control, the medical service will be as useful as any other single device for enhancing the loyalty and devotional morale of the entire industrial group concerned. Adequate industrial medicine is an integral part of any decent physical foundation for a righteous industrial democracy."

THE SOUTHERN MEDICAL ASSOCIATION.

Special sleepers will start both from Lexington and Louisville for the Southern Medical Association meeting at Hot Springs, Arkansas, November 14-17. It has been most interesting to see how rapidly the number in

attendance at this splendid meeting have increased. Many of the medical problems of the South are peculiar to it, and there is a spirit of liveliness and good fellowship in the Southern Medical Association that is not excelled in any other organization anywhere. Hot Springs in November is a peculiarly delightful place to go. It is of especial importance that members who desire to attend write the Secretary, Dr. Seele Harris, Birmingham, Alabama, in ample time before hand to receive an identification card as member so that they can be authorized to purchase round trip tickets on the railroad; otherwise, they will be compelled to pay full fare. If you are in doubt about going write for your identification certificate anyway.

ORATION IN MEDICINE

THE DOCTOR OF TOMORROW.*

By P. D. GILLIM, Owensboro.

I may have chosen a subject with which I have only a slight acquaintance and surely not bolstered by a prodigious bibliography for much of what I have read on this subject is filled with doubts and contradictions.

My ardor in my opinions may have started my pen in a wrong direction, but there seems to be a restless spirit of innovation within our ranks which has produced confusion, and I believe warrants discussion and I may ask, who has a greater right to discourse on his destiny than the general practitioner?

It has been said "The past is the key to the present," and while I have not found the past nor the present the key to the future, I desire to be bold enough and conservative enough in this age of transition to predict a place in the future scheme of things for the general practitioner.

We are just now a target for the innovators whose imputations of inefficiency and incapacity, while not entirely false, are cynical and exaggerated.

I do not intend to enumerate our shortcomings some real, some fancied, neither do I intend to proclaim our grievances which are neither large nor many. But my desire is to present some thoughts by way of a few fragmentary suggestions with the hope of promoting capacity, efficiency and accord among us that by our life and work we may serve humanity better.

I do not mean to disparage the work of ourselves, nor our noble predecessors when I ap-

*Read before the Kentucky State Medical Association, Louisville, September 19, 20, 21, 22, 1921.

prehend changes which shall conform to modern medicine.

We have witnessed the rayless and pathless mist which enveloped the medicine of our forefathers fade before the researches and discoveries of scientists. We have witnessed their wonderful arts and dogmas, replaced or strengthened by the accumulations of science and truth, and there has evolved in a score of years modern medicine with its many ramifications, as boundless as a vast plain. If we spread ourselves over all of it I fear the film would be too thin. To avoid attenuation and consequent incapacity two avenues have been suggested. One of which is to become a profession of specialists. The other, divers forms of cooperation.

The specialist has been an ornate member of our profession for many years, and his limited field has given him time to cultivate his special senses that he might care successfully for that proportion of patients which we have need to refer to him.

I observe reason in the aspiration of the entomologist who desired to live again that he might study but one insect. It is such as he in every branch of science that frequently lead the way.

There have been suggestions from responsible sources which would have our medical schools turn out specialists. I cannot see the wisdom in this suggestion. I can only see a prodigious number of misfits. One must study general medicine to find one's self, and where else could one obtain that deep and broad foundation so necessary in any specialty except through the encyclopedic knowledge obtained by the study or the practice of general medicine? There is a sympathy and understanding between specialists of this type and general practitioners which is desirable and I do not believe the public, nor the profession, would benefit by any change in that relationship.

The physician does not believe that tomorrow will rob him of his heritage and demand that only he is fit who specializes. While the majority of practitioners will practice for the whole and will do it well, I believe some physicians of tomorrow following their conceptions of experience will find their aptitude and interest will not cover the whole and shall limit their practice accordingly. Some will limit their practice by eliminating obstetrics, others will limit their practice by eliminating genito-urinary diseases—still others will limit their practice by eliminating several branches just as did the eye, ear, nose and throat men, they left out the chest and abdomen. There are not many hard and fast specialties, and I believe in the future there shall be fewer for there can be any number of

limitations. These physicians do not care to be harrassed by any legislation which interferes with their free choice in this matter. Their natural conclusion is since they are qualified to practice for the whole they are qualified to practice for a part of the whole. Let us not have cast in medicine—it will be a barrier to cooperation. Now our practitioner has always taken a proud pleasure in his work, he is forever jealous of the rights and duties intrusted to him, and is today serving a satisfied public. Those who have developed a habit of critically estimating the value of him by comparison with their theoretic standards shall not find this grand body of women and men giving their lives to general practice so ductile and so fluid that they can put them in their revolutionary mould and make them according to their theories.

The following suggestion on cooperation which I have gleaned from observation and reading impress me as being modern, fair and by no means too difficult to anticipate. The factors necessary in these cooperative plans are a united profession, a County Health Department, a hospital, a pathological laboratory and an X-ray laboratory. With these five factors in close cooperation in every community of physicians in our state, every general practitioner and specialist shall enjoy many of the advantages of the group, only obtained at present in our larger centers. This plan places every physician in the community at the head of a miniature group—each one using the same health department, the same hospital, the same pathological and X-ray laboratories. Any community that can maintain a dozen doctors, be it town, county or district, can maintain these invaluable agencies, which must serve the physician daily that he may be the modern doctor of tomorrow.

The advent of the County Health Department with its all time health officer is one of the epoch making strides for health which every physician should welcome. They should work in perfect accord, their mission is the same to alleviate human suffering. The health departments of to-day are pioneers and must hew paths through the forests, yet untrodden. Their work of Public Health preventive medicine and education is large enough to consume all their energy and I do not believe there is any call for, nor any need of health departments treating disease. There are city-paid, or county-paid, or private physicians to relieve them of this task. I believe the field of education is prodigious enough to call for the combined efforts of public health workers and physicians. We must work with our health boards in the grand campaign of never-ending education of the public. They miss a

golden opportunity if they do not work through us, enlisting us in every movement for public health. They will find the influence of a hundred thousand physicians more potent than public health laws.

Some have thought that public health activities had paternalistic tendencies. This is flimsy logic and I cannot see the connection. I am sure physicians in public health service do not want such diabolical chaos any more than we do. For we cannot imagine seeing half of our population flat of its back, drawing a premium for laziness and malingering. There is a small but noisy remnant of our population outside the medical profession—this remnant of busy but irrational intellects, followers of the faulty teachings of Karl Marx. It is they who would initiate some of their puerile socialistic ideas into the medical profession and have so-called state medicine saddled on us. But we shall not become their proselytes and I cannot conceive of the doctor of tomorrow floundering in such a stagnant pool of socialism. I do not need to admonish against these idle dreamers. Their thoughts are not robust and usually die a marmalade death.

I have spoken of the necessary factors which speak of the last essential. Individual qualification. This is and always has been the most important factor in our learned profession. We must surround ourselves with a strong bulwark of education and knowledge strong enough to withstand enemies from within and without, ever remembering that all structures must be continually renewed, or they crumble away and become obsolete.

In closing my comments on the doctor of tomorrow, we must not forget the spirit and faith of the doctor of yesterday. It was by his strength, by his life, by his work that people lived. He was not only a physician for human disease, he was a physician for human misery. His work was hard, his tools were few, but he was master of his science and art. If we fail to emulate these noble predecessors of yesterday we shall not be the fit doctors of tomorrow.

Operations for Pulmonary Tuberculosis.—In two cases of pulmonary tuberculosis with adhesion of the diseased lung to the chest wall and marked improvement followed resection of the large cavity, one patient was a woman of 38, and seventh to the tenth ribs, a total extent of 40 cm. In the second case, a bone-periosteum flap from the crest of the tibia was implanted in the subcutaneous cellular tissue and beneath the periosteum of the fourth rib, over the cavity. The aim was to induce a reaction in the pleura which would start sclerosis and immobilize the wall of the chest over the diseased portion of the lung.

ORATION IN SURGERY

SYMPTOMS, DIAGNOSIS AND TREATMENT OF INFLAMMATORY LESIONS OF THE NASAL ACCESSORY SINUSES—FROM THE VIEWPOINT OF THE GENERAL PHYSICIAN AND SURGEON.*

By S. SHELTON WATKINS, Louisville.

INTRODUCTION.

Everybody knows that "head colds" may occur anywhere and at any time all over the world, but is the fact generally appreciated even by members of the profession that nearly every head cold in adults and young persons means an infection of one or more of the nasal accessory sinuses? Most of these patients get well in a few days or in three or four weeks but in many the infection becomes chronic, and even then, unfortunately the fundamental trouble may go unrecognized for months or years.

For many reasons, then, infections of the nasal accessory sinuses demand our careful consideration. They are widely prevalent and have a tendency to chronicity; they are disagreeable to the patient and those that surround him. But this is not all. In the presence of an infection located in the head and in close relation to vital parts we are liable to have *complications* which at times are highly dangerous and in any case may be productive of temporary or permanent disability. Thus as a consequence of nasal sinusitis, we may have brain disorders which are always serious and may end fatally, or again we may have an impairment of one or more of the special senses, often serious, sometimes irreparable; and finally a chronic sinusitis may constitute a focus from which may arise a systemic disease. If these patients consult anyone they usually go to the family physician; hence it is important that every practitioner should not only recognize the seriousness and discover the origin of "head colds" but should also be able to treat the acute stage. Chronic cases usually belong to the specialist.

My subject is too large to admit of discussion here from every standpoint. I shall, therefore, limit my remarks strictly to the clinical point of view.

*Read before the Kentucky State Medical Association, Louisville, September 19, 20, 21, 22, 1921.

SYMPTOMS.

The chief symptoms of inflammatory lesions of the nasal accessory sinuses are: discharge, nasal obstruction, headache, fever, malaise and grippy pains over the body.

A *nasal discharge* is practically always due to disease of the nasal accessory sinuses. In rare cases an infection may be limited to a portion of the nasal mucous membrane, but as a rule it is associated with a sinus infection, although in the beginning the rhinitis may have been primary. In young children, before the sinuses have become well developed, diseased adenoids may be the only cause of a chronic nasal discharge, but in adults and children who have had the adenoids removed, a discharge from the nose is strong evidence of nasal sinusitis.

In the acute stage the discharge usually is very abundant and purulent. In the chronic stage it is comparatively slight in amount and more mucopurulent. Moreover, the discharge is often intermittent in chronic cases.

Obstruction to breathing through the nose may be due partly to damming up of the discharge and partly to the engorgement of the turbinal mucous membrane, especially of the inferior and middle turbinates. Both inspiration and expiration are usually interfered with. Also, the loss of smell may be attributed primarily to the swollen turbinates, especially the middle and superior. This difficulty in breathing and loss of sense of smell is usually worse during the acute stage, although not infrequently they may become permanent owing to a chronic hyperplasia or polypoid degeneration of the nasal mucous membrane.

Headache is more pronounced in the acute than in the chronic stage of nasal sinusitis, because in the former the obstruction to drainage is more marked and the virulence of the micro-organisms is greater. In rare cases it may be absent in the acute stage, especially when drainage is free. It is more liable to be absent in the chronic stage, although not infrequently it is a prominent symptom. Usually it is intermittent and localized in one part of the head, whereas a headache in acute sinusitis is more often widespread and more or less continuous.

A characteristic sinus headache begins in the morning or forenoon, often on awakening; but there are frequent exceptions. Some authors claim that a headache localized in a certain part of the head is characteristic of infection of a certain sinus and have mapped out the head accordingly; but this view draws largely upon the imagination. All that can be reasonably claimed is that infections of the anterior sinuses usually produce headache just over or around the eyes, in the fore-

head, temple or vertex, and that those of the posterior sinuses usually produce temporal and occipital headache or pain in the back of the neck. In infection of the maxillary sinus, pain in the cheek may be increased by leaning forward.

Fever may be quite high in some acute cases, as much as 103 degrees to 104 degrees F., but in the average case it ranges between 100 degrees and 102 degrees F. When the temperature is above 104 degrees F. complications should be suspected, such as an abscess in the orbit, meningitis, osteomyelitis or erysipelas. The temperature is normal in most chronic cases, but occasionally chronic sinusitis may cause a persisting and slight degree of elevation in the temperature.

Malaise is often so marked in acute sinusitis as to incapacitate the patient. While less pronounced than in acute cases, it occurs often in a mild form in many chronic cases. "Worn out," "used up," "no good for work," "without pep," and "tire easily" are characteristic complaints. Often, too, there are pains in the muscles, usually limited to one or two groups, and in various joints, as a rule, however, without definite signs of an arthritis.

Associated with nasal sinusitis we may find many symptoms, gastro-intestinal, respiratory, ocular, and mental. For the most part, however, these may be looked upon as due to some complication or to a peculiar reaction on the part of the patient to the disease, and need not be discussed here.²

DIAGNOSIS

In making a diagnosis of disease of the nasal accessory sinuses, the important aids are as follows: a careful history, an examination of the nose, the elicitation of tenderness, transillumination, the x-ray pictures, catheterization, and proof-puncture.

History. A history of frequent head colds, of blowing the nose or of persistent hawking, should make one suspicious of a sinus infection. Of course other conditions, especially adenoids—even in adults—may cause a chronic postnasal discharge, but sinusitis is by far the most frequent cause.³

Examination of the nose: Examination of posterior nares and nasopharynx should be made in addition to anterior rhinoscopy. This can be done satisfactorily in many cases with a small mirror, otherwise the nasopharyngoscope should be passed. Discharge in the anterior portion of the nose comes, as a rule from one or more of the anterior group of sinuses, viz., the frontal, anterior ethmoidal cells and maxillary, which drain anteriorly in most cases. Discharge in the posterior portion of the nose is usually from the posterior group of ethmoidal cells or the sphenoid, but

in a fair percentage of cases the maxillary and much more rarely the frontal may drain posteriorly when the maxillary orifice and the naso-frontal duct are situated abnormally far back in the middle meatus. The accessory orifices of the maxillary when present drain posteriorly. A postnasal is more common than an anterior discharge.

The presence of polypi in the nose is practically diagnostic of a chronic sinusitis. They may come from cells within the middle turbinate, but such are really misplaced ethmoidal cells. Polypi from the maxillary sinus may grow posteriorly as well as into the anterior portion of the nose.

Tenderness on pressure. The usefulness of this sign is limited to the maxillary and frontal sinuses. In most cases of acute sinusitis the inferior wall of the frontal and the anterior wall of the maxillary are tender to pressure made with the index finger or thumb, and often the pain is very sharp. In chronic cases tenderness is rarely present. In patients who are nervous or, are suffering from headache due to some systemic condition, for instance, gall bladder disease, the maxillary and frontal may be tender to pressure, but in such cases the whole head is liable to give the same sign.

Transillumination₁: The use of this method also is limited to the examination of the frontal and maxillary sinuses. The claim that the anterior ethmoidal cells can be transilluminated satisfactorily is not borne out by the experience of most rhinologists, although occasionally they can be transilluminated fairly well.

The best method of transilluminating the maxillary sinus is the one introduced by Briggs.₅ The small electric lamp (measuring about 1.8 x 1.4 inch) is gently inserted backward along the floor of the orbit between it and the eyeball as far as possible without causing pain or using force. The eyelids should be closed, the mouth opened and the cheek on that side retracted; the light should be gradually increased to the maximum. When the sinus is clear, the light will illuminate the floor, the external and the nasal walls. Sometimes when the floor (the hard palate) is very thick, it will not 'light up,' but if the sinus is clear the external and especially the nasal walls will be illuminated. In doubtful cases, therefore, the inferior meatus of the nasal cavity on that side should be examined by means of a speculum.

Among other methods of transillumination are: the mouth method (in which the lamp is placed in the center of the hard palate) and the gingivo-buccal method of Coolidge. The latter, like the Briggs' method, has the advantage that we have thinner walls to illuminate

than in the mouth method, in which the light must pass through the thick hard palate which forms the floor of the maxillary sinus; but the Coolidge method has the disadvantage that the light has to be put into the patient's mouth. The mouth or palate method has the distinct advantage of illuminating both maxillary sinuses at the same time, and it also should be used.

In transilluminating the frontal sinus the lamp is placed under the floor of the sinus and as far upward as possible. As stated before, the current should be gradually increased from low to maximum and the two sides compared. When clear the anterior wall will be illuminated.

Transillumination is much more reliable for examinations of the maxillary than of the frontal sinuses, because the former are nearly always symmetrical, whereas the latter are nearly always asymmetrical and often one or both of them are absent. But although a purulent discharge, and new growths will obstruct the rays of light, there are also other conditions besides disease, such as small sinuses and thick walls, that interfere with the transillumination and thus lessen the usefulness of this method. This is especially true of the frontal. Moreover, transillumination may be misleading. In cases with cystitis and polypoid formations and when the amount of pus is small the antra and frontals may illuminate very well. Hence it may be said that a clear sinus usually, but not always, means absence of disease whereas a dark sinus has little significance. Transillumination is a cheap and easily applied method of diagnosis and every physician should learn how to use it.

X-ray: All of the nasal accessory sinuses can in most cases be shown satisfactorily in the x-ray film or plate, and this is one of the chief advantages of this method of study. By this means, also, we sometimes find an unsuspected involvement of other sinuses. Among other advantages, it shows definitely the size and outline of the sinus, the septa and divisions;₇ small as well as large sinuses; the rays penetrate thick walls well enough to enable us to determine the condition within the sinus in most cases; it will show cysts and polypi, small amounts of pus and more especially new growths; moreover, it is very useful in locating abscesses at roots of teeth projecting into the floor of the maxillary sinus, the cause of about one-third of the infections of this sinus. The shadow in the film or plate is caused by both the pus and the swollen mucous membrane, but chiefly by the former. It must be remembered that normal cavities show in x-ray films and plates as dark areas, and anything that reflects the x-rays, as pus and new

growths, show as cloudy areas or "shadows." Where there has been absorption of bone the normal bone shadow cast by the lime salts is lost and irregular dark areas are seen.

It is best to take four views, which can be done by using the double screen, without danger of causing alopecia or a burn: the antero-posterior view to show the breadth of the frontal and maxillary sinuses; the forehead view to show the ethmoids; the lateral view to show the depth of the frontals and of the sphenoids; and the chin view also to show the sphenoids. Stereoscopic plates are often most useful, especially in studying the ethmoidal cells. Even a rhinologist need not necessarily know the technique of taking x-ray pictures, unless of course he has an x-ray outfit; but *it is most important for him to be able to read them*₈. It is seldom necessary to resort to the x-ray during the acute stage, but every chronic case should be x-rayed.

Catheterization: This method consists in catheterizing the natural orifice and forcing out the contents of the sinus either by means of air or some mild sterile solution. In some cases it is possible to catheterize the frontal, maxillary or sphenoidal sinuses without first performing a resection of part of the middle turbinate, but in the majority of cases this preliminary operation must be done₉. In expert hands catheterization alone is worth trying when the nasal passages are wide and the middle turbinate is not large, but gentleness must be used for it is possible to penetrate the cranial cavity. Hence the field for its employment is very limited.

Proof-puncture: This is a diagnostic measure that should be applied to the maxillary sinus only. It, too, is a method limited to the specialist's field for it is not without danger₁₀, although in view of the very small percentage of accidents it is a justifiable method in the hands of those who are skilled in performing it. The puncture is made with a straight or curved trocar within a cannula and the former is removed. Air or a mild sterile solution is introduced through the cannula into the sinus to remove the contents or treat the sinus. The site of puncture is usually under the inferior turbinate, although some authorities prefer to enter through the membranous portion of the mesial wall of the sinus which is just above the inferior turbinate and rather far posteriorly₁₁. The nose should be irrigated with sterile normal salt solution to cleanse it of discharge before making the puncture. A specimen of the discharge from every punctured sinus should be examined bacteriologically₁₂. A purulent discharge may be sterile, whereas from an almost colorless discharge pyogenic organisms may

be grown₁₃. Some of these latter type of cases are streptococcic infections.

Puncture gives us the most reliable method of diagnosing disease of the maxillary sinus₁₄. It should not be used unless the findings from transillumination or x-ray indicate disease or lead us to suspect its existence.

TREATMENT.

It is undoubtedly true that most cases of nasal sinusitis pass over with little or no treatment, and that nature plays a big part in many treated cases. It is only a small percentage of cases that give trouble by either developing complications or becoming chronic. An acute sinusitis may become chronic with few or no localizing symptoms after the acute stages are over₁₅, and for months and years be a detriment and danger to the patient's well being. The treatment of the acute and chronic stages of inflammation of the nasal accessory sinuses are best discussed separately.

The treatment of acute sinusitis is local and general. Under local treatment may be mentioned applications of cocaine and adrenalin, the use of various antiseptic solutions, inhalations, irrigation of the nose, heat and cold, posture, and puncture followed by irrigation.

Application of cocaine and adrenalin: A few drops of a five per cent solution of cocaine and of adrenalin (1-6000)₁₆, applied daily on cotton under the anterior end of the middle turbinate will shrink the congested mucous membrane and thereby frequently remove an obstruction to drainage of the orifices of the maxillary sinus and anterior ethmoidal cells, and to the infundibulum. Although the shrinking effect is temporary it often lasts long enough to permit of fairly good drainage, especially if suction is used immediately afterward₁₇. Sometimes infraction of the middle turbinate toward the septum is beneficial in promoting drainage.

Antiseptic solutions if started in the early stage, help to abort the infection and act better after the application of cocaine and adrenalin as described above. Quite a number are in use. My own preference is for argyrol (10 per cent to 20 per cent), protargol (2 per cent), mercurchrome (2 1-2 per cent to 5 per cent), and Dakin's solution. In applying such a solution it is always best to have the patient in the reclining posture with the head extended well backward, so that the liquid passes by gravity to the upper part of the nose. Nasal sprays merely help to remove tenacious discharge but their use several times a day is often helpful. Mild solutions only should be employed, and probably among the best are: a half of one per cent solution of menthol in albolene, and a two per cent

aqueous solution of bicarbonate of soda. Inhalations are often very useful in relieving turgescence in the nose. My favorite is one-half dram of a five per cent solution of menthol in alcohol to one pint of steaming water.

Irrigation of the nose with sterile normal salt solution is sometimes indicated when the discharge is very abundant and tenacious, but the danger of thereby starting an otitis media must always be remembered.¹⁸

Heat and cold: Heat tends to increase the blood supply to the head and to ease pain. It may be used in the form of the hot water bag, electric pad, hot packs, Brunings' electric lamp head bath, and a wool shawl or cap wrapped around the head. Cold is preferred to heat by some patients.

Posture: If the orifices are not too badly swollen, posture is sometimes useful in draining the sinuses. It is more apt to be successful after the proper application of cocaine and adrenalin. The frontals and ethmoids are best drained when the head is upright; the maxillaries, when the head is well downward and the face turned to the same side; the sphenoids, when the head is downward and forward.

Puncture and irrigation: As said before, treatment by puncture is limited to the maxillary sinuses, but irrigation through the orifices may be applied also to the sphenoidal and frontal sinuses after catheterization and often with very beneficial results. In polysinusitis irrigation of a maxillary sinus full of stagnant discharge facilitates drainage of the ethmoidal cells and frontal sinus. If marked improvement does not occur after six irrigations, given every day or on alternating days, this form of treatment should be abandoned. In rare cases the symptoms of complications are so serious that an immediate operation is necessary, but it is by no means always necessary to puncture and irrigate every acutely infected maxillary sinus.

General treatment aims at increasing the patient's resistance. Of course it is not necessary for me to go into details. Sedatives and anodynes in doses to meet the urgent conditions are necessary, but about the general measures to be employed you know as much or probably more than I do. Permit me, however, to emphasize the fact that most sinus inflammations are the result of a run-down condition from physical or mental strain, and that a more or less prolonged rest in bed is indicated. Atropine may be given when the nasal discharge and engorgement are excessive and continue after the first few days, but it should be remembered that a free discharge for the first four or five days is beneficial. It is nature's way of combatting and washing

away the infectious organisms, and atropine early in the disease destroys this aid.

Chronic sinusitis: The non-surgical treatment of chronic nasal sinusitis consists chiefly in the use of antiseptic solutions, vaccines and in increasing the patient's vital resistance by rest and tonics. Of applications I have already spoken. Vaccines are sometimes beneficial and curative, but the opinion of the majority of authors is that in most cases they do little or no good.¹⁹ Autogenous are to be preferred to stock vaccines. It requires usually about ten weeks to give a fair test of the value of vaccine treatment in any particular case. The hypodermic injections are given on the average of one every five days. Rest is very important in these cases, also the patient should lie down after the mid-day meal for thirty minutes, if practicable, and should get at least nine hours of rest in bed at night. Of course he should be relieved of overwork and worry as much as possible.

Some patients with a slight discharge from a low grade so-called catarrhal infection of a sinus find a morning douche of the nose very helpful and often carry it out for years without developing ear trouble. There is, however, some danger in this custom, unless the patient is very careful. A nasal douche is preferable to an irrigation with a fountain syringe because the force of the latter is liable to be too great. The fountain syringe should not be more than one foot above the patient's head. This treatment should be discontinued should the solution tend to flow into the Eustachian tubes.

Surgical: Although the surgical treatment dates back only about thirty years, numerous operations have been developed. Most of them are similar and vary only in details, often minor ones, and all are merely elaborations of a few pioneer operations. To enumerate and describe them would simply be tiresome; hence I shall limit myself to a consideration of the principles involved.

The first aim of surgical treatment of nasal sinusitis is to establish free and prolonged drainage. Intranasal obstructions, such as hypertrophy of the middle turbinate, uncinate process or bulla ethmoidalis, marked deflections of the septum, and polypi, should be removed and, if the drainage passages are occluded, they should be enlarged or new ones made nearer the floor of the sinuses. In doing this we should endeavor to preserve as much as possible the normal function of the parts involved. Many cases of chronic sinusitis will get well soon after the establishment of thorough drainage. But although it will practically always relieve headaches and other symptoms due to pressure and absorption, in many cases the discharge will still continue.

We then know that we have to deal with a focus of diseased tissue which must be located and removed. (In some cases the discharge will continue after the most thorough operations, but fortunately these cases are not frequent.) In a given case of this kind we have to decide between internal and external surgery. This question has been the subject of heated debate for years and the advocates of the two methods are far apart. The only sensible solution, it seems to me, is for the operator to use his own judgment and choose the operation best suited for each case and not be a slave to one routine method. Certain broad rules may help us in our decisions.

An *intranasal operation*, other things being equal, is indicated: (1) when the nasal passages are large; (2) in operations upon the sphenoid; (3) in operations upon a few of the ethmoid cells; (4) in most cases of frontal and maxillary sinusitis without polypoid growths.

External operations are indicated: (1) when intranasal operations have failed; (2) in fistula cases; (3) for removal of mucocoeles or new growths; (4) in serious or threatened orbital and intracranial complications, including osteomyelitis of the superior maxilla and frontal bone; (5) for exenteration of the ethmoidal capsule;²⁰ (6) in a few cases where the ostium of the frontal sinus is on a higher level than the cribiform plate and when the posterior wall of the frontal sinus overhangs the ostium, (in these cases intranasal surgery is very dangerous, because the chances of penetrating the dura are greatly increased); (7) in cases in which the nasal passages are very narrow; (8) in cases in which the maxillary and frontal sinuses are filled with polypi; (9) in cases of very large frontal and maxillary sinuses and in rare cases where divisions exist in them.

Certain important considerations in operations upon the nasal accessory sinuses are also worthy of note:

(1) Do not curette the bony walls any more than is absolutely necessary to remove necrotic areas.²¹ This applies particularly to the superior wall of the maxillary, all walls of the sphenoid, the posterior wall of the frontal and the superior and lateral walls of the ethmoidal capsule.

(2) When the dura has been exposed, enlarge the bony opening carefully and look for tears in the dura. If any are present, wall these off by packing gauze between edges of bone and dura and then enlarge the opening in the latter. In such cases never pack the nose.

(3) Do not continue intranasal operations when hemorrhage is difficult to control

and the field is obscured by it. It is better to stop and complete the operation later.

(4) Do not try to remove every ethmoidal cell by intranasal methods. It is practically impossible to do so in most cases and besides it is too dangerous.²²

(5) Avoid too free use of rasps and burrs for they stimulate the formation of granulation tissue.

(6) Don't perform the external operation on maxillary sinus in children, because the opening in the canine fossa will destroy the nerve filaments to several teeth.²³

(7) It is preferable, in operations upon the frontal and maxillary sinuses, to leave large islands of healthy mucous membrane for the regeneration of new lining membrane. When too much is removed, healing takes place by granulation, and the result is not so satisfactory as when we obtain a new membrane.

(8) Never drain the maxillary sinus through a tooth socket, but remove all abscessed bicuspids and molars that are in contact with the floor of the sinus.

I have endeavored to present this subject in such form that those of you in general practice may benefit by it and in it find answers to questions that come up daily.

REFERENCES AND NOTES.

1. Refer to Skillern (R. H.) Accessory sinuses of the nose, third edition, 1920, 57-58, Lippincott, Philadelphia.
2. Ibid., p. 72. Also refer to paper by Tilley (H.) Inflammatory lesions of the nasal accessory sinuses, etc. *Brit. Med. Jour.*, London, 1920, vol 2, 962-964.
3. Sometimes symptoms of a systemic complication of sinus disease are the only ones for which the patient seeks relief.
4. According to Kyle, various conditions may cause a post-nasal discharge. Kyle (D. B.) Diseases of the nose and throat, fifth edition, 1916, 426-428, Saunders, Philadelphia.
5. Syphilis and other systemic diseases may cause sinus supuration and this fact should be kept in mind.
6. A transilluminator (a small electric lamp with rheostat that is connected with a battery or can be attached to street current) and a dark room are necessary in using this method. If a dark room is not obtainable, the examiner can use an ordinary photographer's dark cloth to cover the head of the patient and himself.
7. Any dental plates present should be removed from the upper jaw before making the examination.
8. Briggs (H. H.) Roentgenography and transillumination; comparative value in diagnosis of diseases of the frontal and maxillary sinuses; author's method of transillumination. *J. Am. Med. Assn.*, 1920, LXXV, 298.
9. There are rare exceptions to this statement. In 152 cases of maxillary sinusitis transilluminated, Pontoppidan found 142 positive. In ten there was a purulent secretion but no opacity. Pontoppidan (F) Quelques experiences sur la sinusite maxillaire. *Acta Oto-laryngol.*, Stockholm, 1918-19, I, 74-85.
10. Syme says that septal formation is quite common in the maxillary sinus. In two cases he found complete divisions: one into upper and lower, and the other into anterior and posterior compartments. Syme W. S.) A series of cases of maxillary disease; some points of interest. *Jour. Laryngol., Rhinol. and Otol.*, London, Dec. 1919, 478. Also, Hajec (M) Erkrankungen der Nebenhöhlen der Nase. *Vierteljahrsschrift, Leipzig u. Wien*, 1915, 65.
11. The rhinologist can better judge than the roentgenologist, unless the latter follows the cases and compares his findings with those of the clinician. Much time is required to do this and it is, therefore, impracticable.
12. Unger (M.) A new instrument and method for washing and draining the nasal sinuses; preliminary report. *Laryngoscope*, St. Louis, 1920, XXX, 561-565.

10. Brown-Kelly (H. A.) Difficulty and dangers of exploratory puncture of the antrum of Highmore. *Jour. Laryngol., Rhinol. and Otol.*, London, Dec. 1914, 556. This is an excellent and very thorough article.

11. One must be very careful in using this route because of the danger of entering the orbit.

12. Babcock found in a bacteriological study of 100 cases of nasal sinusitis that the findings in smears very closely agreed with those obtained from cultures. Babcock (J. W.) Bacteriological and clinical aspects of infection of the accessory sinuses. *Laryngoscope*, St. Louis, July, 1918, 527.

13. Watson-Williams (P.) Latent sinusitis in relation to systemic infections, especially with reference to rheumatoid arthritis. *Jour. Laryngol., Rhinol. and Otol.*, London, July, 1919, 233-237.

14. In rare cases this method is unsuccessful owing to the presence of tumors, polypi and thick pus, or to an excessively thick lateral nasal wall. Pontoppidan (F) *Loc. cit.*

15. Several months ago I washed out nearly an ounce of pus from the maxillary sinus of a patient who had a chronic purulent postnasal discharge of which she was unconscious. She was free from headaches.

16. The excess of the solution should be squeezed out. Use only two or three drops of adrenalin. Strong solutions of adrenalin are apt to irritate the nasal mucous membrane. Caution the patient not to swallow, for cocaine is absorbed very rapidly by the stomach and most accidents are caused by swallowing the drug.

17. Use suction in adults only at a pressure of not more than ten inches of mercury. Greater suction may cause pain, hemorrhage, and even cerebro-spinal rhinorrhea. I personally know of a case of the last named condition that followed the use of too strong suction by a well-known specialist in another city. Hastings and Sir St. Clair Thompson recommend that the patient be taught to aspirate the sinuses by inhaling with the mouth and nose closed. Hastings (S.) The treatment of antral suppuration. *Lancet*, London, 1919, II, 960-962. Thompson (Sir St. C.) The treatment of acute nasal sinusitis. *The Practitioner*, London, 1921, 106, 1-9.

18. Keep the patient's head well lowered and have him keep his mouth open. Stop the irrigation should he begin to cough or sneeze.

19. Refer to Skillern (R. H.) *Loc. cit.*, 90. Thompson (Sir St. C.) Diseases of the nose and throat, second edition, 1917, 254, Appleton, New York.

20. The external procedure of Moure offers the best method of operating upon the ethmoidal cells. It gives excellent exposure and so far as my experience goes is the safest operation for extirpation of all the cells. The chief disadvantage is the scarring.

21. In free curettage of the bony walls in the presence of infection there is danger of producing osteomyelitis. Refer to paper by McKenzie (D.) Diffuse osteomyelitis from nasal sinus suppuration. *Jour. Laryngol., Rhinol. and Otol.*, London, 1913, No. 1, 6.

22. Refer to papers by: Tilley (H.) The intranasal treatment of empyema of the frontal sinus. *Jour. Laryngol., Rhinol. and Otol* London, May, 1914, 242-255. Cushing (H.) Accessory sinus disease and choked disc. *Jour. Am. Med. Assn.*, July 24, 1920, vol 75, No. 4, 236. Watkins (S. Shelton) "Accessory sinus disease and choked disc." *Kentucky Med. Jour.*, September, 1920, vol XVIII, 306.

23. Tilley (H.) Acute suppuration of the nasal accessory sinuses in children. *Jour. Laryngol., Rhinol. and Otol.*, London, July, 1915, 292-294.

OFFICIAL ANNOUNCEMENTS

OFFICIAL MINUTES OF THE SEVENTY-FIRST ANNUAL MEETING OF THE KENTUCKY STATE MEDICAL ASSOCIATION, HELD AT LOUISVILLE, SEPTEMBER 20, 21 AND 22, 1921.

TUESDAY, SEPTEMBER 20—FIRST GENERAL MEETING.

The Association met in the Auditorium of the Seelbach Hotel and was called to order at 9 a.m. by the President, W. W. Anderson, Newport, who said: The seventy-first annual meeting of the Kentucky State Medical Association will please be in order. It is fitting and in keeping with our long-time custom that we, who undertake the healing of the sick, should at the beginning of our session bow reverently and look to Him as the only Great Physician.

We will be led in prayer by the Rt. Rev. Charles E. Woodcock, Louisville.

INVOCATION BY RT. REV. WOODCOCK.

Almighty God, Father of all wisdom, we turn unto Thee for guidance and inspiration in all our doings. Thou hast constituted the services of men in a wonderful order. Bless, we beseech Thee, the physicians of the Kentucky State Medical Association and healers of the body in our midst. Give them wisdom, strength, patience, and a life of service. Grant that each one in his ministry may so serve as to be ashamed of that which he does for the welfare of man. Bless us all in our needs. Give us faith in Thee, faith in one another, hope in life, strength in service, inspiration in all our duties. Bless the individual services of the members of this Association, and may those who receive their ministries have that due appreciation of all that is done for Thy service. Help us all to further the best interests of the welfare of humanity in this commonwealth. Guide us day by day. Direct us in all our doings. Further us with Thy continual help, in order that all our works may be continued and that we may glorify Thy holy name through Jesus Christ, our Lord. Amen.

THE PRESIDENT: An address of welcome will be delivered by Dr. S. J. Meyers, of Louisville.

Abnormal Forms of Diphtheria.—Darre discusses the simple catarrhal form of sore throat, without membranes, but for which the diphtheria bacilli are responsible; every sore throat is suspicious when diphtheria is epidemic. Another perplexing form is when the diphtheria attacks adenoids first. The extreme pallor, small pulse and other signs of severe intoxication should give the alarm, for the diphtheria toxin is absorbed with extraordinary rapidity from adenoiditis. Another type described simulates follicular tonsillitis or there may be a form suggesting herpes. The most deceptive form is when the violent pain in the neck, trismus and the aspect of the pharynx suggest a phlegmon around the tonsil.

ADDRESS OF WELCOME BY DR. MEYERS.

Mr. President, Members of the Kentucky State Medical Association, our Guests, Ladies and Gentlemen:

It gives me a great deal of pleasure to give you this address of welcome, but why an address of welcome? If it were not for Kentucky, we would not have a Louisville. If it were not for the Kentucky doctors, we would not have the Kentucky State Medical Association, and I am sure, if it were not for the wise councilors and the excellent State Board of Health, we would not have a profession that we should rightly be proud of. May I not say that this is more of a home-coming week because certainly it is home for most of us. Louisville houses the Alma Mater of most of you gentlemen, and I am sure that many of you have spent some of the most happy or unhappy days during your student life in this city. Many of you picked your sweethearts in Louisville, and many of you have taken your wives from this town. It is a home-coming week, a mingling of old and young friends, and it is worth while. We see the young man who is full of enthusiasm, whose eyes are still full of luster, who has placed before him a goal and has reached it; and the older of us, through all the hardships of a long and trying practice, think it is worth while.

Fortunately, doctors do not measure their success by the stores they put away. They measure their success by the work they have done and by the esteem in which they are held by their constituents, and I am sure each of us has something to be proud of in the places we occupy in our various communities.

I hope while you are here, you will be interested in the scientific program. I hope you will meet enough old friends that your meeting together will give you the greatest amount of pleasure. The social side of these meetings grows less and less each year, because as each year comes men know what they want; they know what their pleasure is, and we generally allow them to do pretty much as they please. You can attend the meetings with your friends, go to the theater, go sightseeing, or do anything else that will add to your comfort and pleasure.

While I welcome you as an association to this city, may I digress for a moment and ask you to do some welcoming. I want to ask you to welcome the young men into medicine. I will not quote statistics, but you know, as I know, that Kentucky, as most of the states, needs

doctors. The young man is not interested as he was when you and I were boys, and I am going to ask that as you go into your counties and cities you act as recruiting officers and see if you cannot interest our young men in medicine, if you cannot tell them the possibilities of the future of this great profession. Personally, I think the future of medicine is better than the future of any profession of which we know. I hope that you will be able to get many recruits so that the country towns and villages that are depleted will have young men to grow up in medicine as they formerly did.

I am going to ask you to give another address of welcome, and that is your help in a free altruistic way. The State of Kentucky has now what is known as a Board of Charities and Corrections. This Board has under its control the various institutions, the hospitals for the insane, the penitentiaries, the reformatories, the feeble-minded institute, and so on. These institutions formerly were nothing but repositories for the sick, for the criminals, and for the insane. Some of us have been asked to help to put these institutions upon a scientific plane. All of you are going to be asked to do your part in helping them so that these poor unfortunates not only will be incarcerated as they are now for the rest of their lives, but we wish to give them physical and medicinal aid; we want to give them scientific reconstruction and medical attention, so that it is probable that many of the insane may be restored to their faculties, and it is also possible that many of the criminals by proper treatment may be put in the right path.

If this address of welcome has made you any happier than when you came; if you are able to get one or two recruits for the medical profession; if your sympathy goes out to these poor unfortunates in the institutions of your State, even though my rhetoric has been poor and my oratory bad, I am glad I came to welcome you. (Applause.)

THE PRESIDENT: In the absence of Dr. C. G. Stephenson, of Winchester, who was to have responded to the address of welcome, this pleasant duty will be performed by Dr. James A. Davis, of Covington.

RESPONSE BY DR. DAVIS.

Mr. President, Dr. Meyers and Fellow-Members of the Kentucky State Medical Association:

While listening to the beautiful words

of welcome of Dr. Meyers we were wondering whether or not to sit still and look like a fool, or endeavor to speak and remove all doubt. (Laughter.) I think that I voice the sentiments of each and every one of you present when I say that we have been thrilled with the beautiful and cordial address of welcome we have received, and we cannot permit silence to give consent.

We have met here as the representatives of an honorable profession for improvement and advancement. We come to the City of Louisville bringing thoughts of the best that there is in medicine and surgery in order that each of us may become a better practitioner. We hope that this meeting will enable us, as we return to our homes, to carry back the finest and best in medicine and surgery, and spread it broadcast in order that suffering may be relieved, and lives strengthened and prolonged. We accept, Dr. Meyers, your very cordial welcome and extend to you our best wishes, assuring you that in mingling together the spirit of our meeting will be enjoyed by each and every one of us. We look forward with keen interest to the time when we may again have the opportunity of having a jolly good time in the good old City of Louisville. I thank you. (Applause.)

THE PRESIDENT: The world has at the present time, perhaps as never before, a most urgent need of intelligent, sane and consecrated leadership. What is true of the world in general is particularly and especially true now—at least it appears so to us—the need of leadership along medical lines. It has always been the pride of medicine that we have walked before the people pointing out the way to their physical salvation. We have the honor to be representatives of the only profession that has never been forced to reform. This profession has never been dragged before the public and execrated for its shortcomings; it has always reformed itself from within and usually long before the public became aware of the need of reform. But we are in a state of rapid transition, and the need along medical lines calls for leadership in medicine that the people may be directed in a safe way of advancement that they may not come to any harm under mistaken and ill-guided and ill-considered plans of forward movement.

It is a great pleasure to me, having had the unmerited honor of presiding over your deliberations during the past

year, to surrender this office to one whom you have wisely chosen to be your representative before the people and your leader; one who has a public spirit in him and a far-seeing vision to give to us competent leadership and to help us in directing the people along the lines of medical progress.

I call upon Dr. Boggess and Dr. McClure to bring the President-elect to the platform.

Dr. Stucky having been escorted to the platform, Dr. Anderson, in addressing him, said: I pin on you the badge of your honor well deserved, and I present to you the gavel of your authority. Ladies and gentlemen, your President, Dr. Stucky. (Applause.)

REMARKS BY DR. J. A. STUCKY, PRESIDENT OF THE ASSOCIATION.

Mr. President and Members of the Kentucky State Medical Association:

That I am not unmindful or ungrateful for the great honor that you have conferred upon me, I shall not attempt to tell you in words. My deeds, my leadership, my work during the coming year must speak louder than anything I could say.

It has been decided that my address will be delivered tonight at the opening meeting, and at that time I shall speak very freely to you, very frankly to you, and very frankly and freely to the public. (Applause.)

We will now begin with the regular order of the program, and the first thing will be a report of the Chairman of the Committee on Arrangements, Dr. John K. Freeman.

In the absence of Dr. Freeman, Dr. George A. Hendon said: The Committee on Arrangements have devised certain means of diversion. We will have a meeting tonight at which the President's Address will be delivered, and perhaps some other address, after which there will be in this room a picture show.

Tomorrow evening, at 7 o'clock, in the dining room of the Seelbach Hotel, we will have our annual banquet, at which there will be no special set speeches, but certain members of the profession will be called upon to address the meeting impromptu after we have had a good dinner.

Tomorrow evening (Wednesday) at the Pendennis Club, Dr. Freeman has arranged for the ladies to hold a reception.

You will no doubt find the details of

these things on your program to refresh your memory.

The reading of papers was begun.

Robert T. Pirtle, Louisville, read a paper entitled "Tuberculosis of the Spine," which was discussed by Drs. Garr, Stewart, Miller, Davis, McCormack, Anderson and Owen, after which the discussion was closed by the essayist.

Milton Board, Louisville, read a paper entitled "Federal Care of the Veterans," which was discussed by Drs. Anderson, Solomon and McCormack (Arthur T.), after which the discussion was closed by the essayist.

The Secretary moved that Dr. John F. Anderson, New Brunswick, New Jersey, and Dr. W. M. Brunet, New York City, be given the privileges of the floor and invited to sit on the rostrum, so that the members may become familiar with their faces and extend to them the cordiality that we feel towards these distinguished visitors.

Seconded by Dr. Anderson and carried.

W. J. Shelton, Mayfield, read a paper entitled "The Progress of Preventive Medicine."

The paper was discussed by Drs. McCormack, Stucky, Morrison, Miller and Griffith, after which the discussion was closed by the author of the paper.

The Secretary called attention to a subject considered by the House of Delegates at its session and said: The most important thing we have today to do is to get into the profession, the allied professions of medicine and nursing, men and women of character who will continue this work as we get old and as the necessity for them becomes apparent. We must have in Kentucky at least three times as many medical students as we have today to take the places of those who are dropping out. We need to have twice as many nurses as are now in hospitals if we would adequately fill the demand for nurses. We want as doctors and as nurses men and women of the same character who have heretofore made these professions honorable and respectable, and in order to secure them we must begin with the man who is going to be a medical student when he is a boy, when he starts in his high school because he must study certain preliminary branches of medicine in order to be admitted to a medical school or college today. When a high school student, in all probability he will take up medicine by devoting himself to a study of biology, physics and other sciences that are abso-

lutely prerequisite to a proper appreciation and preparation for the problems of medicine. This matter should be drawn to the attention of students of high schools. From sixty counties in Kentucky there has not been a medical student during the past year. From even more counties there has not been a pre-medical college student.

In the training schools of the State there are barely 60 per cent of the vacancies filled. There was never a better opportunity for leadership among men and women, but we do not desire men who merely want to measure their success by the size of their bank account. We have never wanted that sort of men in the profession. They are a distinct minority, but we do want self-respecting, careful, painstaking business men like those who have honored the profession in the past, who will now go into it and carry on the work as you have done throughout your practices. It is important to get thousands of the young men and young women of this country into these professions. We have more than sixty vacancies for public health nurses, paying salaries of \$125.00 per month and upward. Our communities want nurses.

I see before me a number of men who are interested, who write to us that they lose cases because we have not enough nurses. I have taken the pains to investigate this matter and find that there are no student nurses from the counties where they want them. Nurses are not found ready made, but first must submit themselves to a definite course of training. It is important that young women be selected by you who know about the necessity for them and the character of men and women we need. We want women of good moral character, with brains, who can acquire knowledge, who can show kindness and tenderness in their work. We should select from them especially those who are particularly fitted to become and can make good public health nurses.

The vast majority of doctors ought to be general practitioners. Nineteen doctors out of twenty ought to be general practitioners, and the American Medical Association has turned the clock on medical education, and from this time on every graduate from a medical college will graduate as a general practitioner, and he will no longer be considered a specialist in the five years he is an undergraduate student. Let us do our part in Kentucky and have the sick nursed by

Kentucky women and the sick treated by Kentucky doctors, and let diseases be prevented and education and sanitation carried on by Kentucky folks. We have the brains, we have the means—in fact, everything in the City Hospital right now. We have less than half as many nurses as we need to take care of sick people in our institutions. A young woman with one year of high school education can go to any one of the good hospitals in Kentucky and be paid eight to eighteen dollars a month for the first two years; fifteen to thirty dollars a month in the third year of her education, and be given her uniform and board. She can go through her whole education practically without expense to her family, and with these advantages she becomes a member of a great profession. As you go about the country and see the splendid young womanhood you see, why is it that sort of thing now exists? It can only be because they do not know about the advantages of nursing. Let us each have two or three young women for whom we are responsible and urge them to train themselves for the nursing profession.

Let us endeavor to get desirable young men as medical students and train them as your fathers trained you. Many of you had the advantage of preceptors: men learned in the science and art of medicine. Let us see to it that the brain of the young man does not become developed at the expense of his heart and soul. Let us fire him with zeal by citing examples of the great good that has been accomplished by the fathers in medicine, and let him understand that it is far more important to relieve the sick than it is to know what is the matter with a man, than to know of what he died. Let us try to relieve those who are sick, those who are suffering, those who are in pain. It is our duty to do this because our profession affords the greatest opportunity for doing good that there is in all the world.

I know you and I love the members of our profession for what they do and have done. I have had the opportunity to appear before other medical and legislative bodies almost every month, and when I have come back and looked into your eyes and have seen the clear vision of my profession, I have become thrilled and stimulated by your zeal and the splendid manner in which you do things, and it has been a pleasure for me to carry a message from you because I know I am carrying a message from

the members of the greatest profession, the greatest body, that can be gathered together anywhere. (Applause.)

S. S. Watkins, Louisville, delivered the oration in surgery. He selected for his subject, "Symptoms, Diagnosis and Treatment of Inflammatory Lesions of the Nasal Accessory Sinuses, From the Point of View of the General Practitioner."

On motion, the Association adjourned until 2 p.m.

FIRST DAY—AFTERNOON SESSION.

The Association reconvened at 2 p.m. and was called to order by the President.

Henry Enos Tuley, Louisville, read a paper entitled "Aids to Diagnosis in Medicine," which was discussed by Drs. Bradley, Solomon, Pope, Bate, Morrison and Sprague, and in closing by the essayist.

Curran Pope, Louisville, read a paper entitled "A Study of Gall-Bladder Lesions by the Lyon-Meltzer Method."

J. T. McClymonds, Lexington, followed with a paper entitled "Some Observations on the Lyon-Meltzer Method for Diagnosis of Gall-Bladder and Bile Duct Diseases."

These two papers were discussed together by Drs. Lucas, Dowden, Simpson, Jenkins and Sherrill, after which the discussion was closed by the authors of the papers.

John F. Anderson, New Brunswick, New Jersey, read a paper (by invitation) entitled "The Application of Biologic Agents in the Diagnosis, Prevention and Treatment of Contagious Diseases."

This paper was discussed by Drs. Little, Young, Bradley, Thornton, Kelley, South, Scott, Hertzsch, Robbins, Nickell, Bizot and Flexner, after which the discussion was closed by the essayist.

J. Rowan Morrison, Louisville, read a paper entitled "Blood Transfusion in Medical Diseases," which was discussed by Drs. Flexner, Scott, Duerrant, Grigsby and Hume, and in closing by the essayist.

On motion, the Association adjourned until 8 p.m.

FIRST DAY—EVENING SESSION.

The Association reconvened at 8 p.m. and was called to order by the Secretary, in the absence of the Vice Presidents. In introducing the President, Dr. J. A. Stucky, Lexington, he said: I esteem it a great privilege to present to you a gentleman who needs no introduction either to the medical profession or to the relatives or friends of the medical

profession in Kentucky; a man who for many years has been honored and has honored us not only at home but in the nation; a man who has given of his great talents and his great heart all that he could in the leadership that has been the proudest possession of the medical profession of Kentucky; a man who has gone into forgotten places, places to which no roads led, carrying those things that mean light to the afflicted, opening the eyes of the blind and making them see the beauties of the nature that surrounded them. It is a pleasure and privilege to present to my fellow physicians in Kentucky and their friends our beloved President, Dr. J. A. Stucky, of Lexington. (Applause.)

President Stucky selected for the title of his address "Medical Evolution and Reconstruction."

At the close of the President's address the Secretary said: It is a matter of great regret that Dr. Stuart McGuire, of Richmond, Virginia, an eminent surgeon, a delightful friend and great professional brother, is not able to come here on account of the sudden illness of his brother. In his absence, however, the Council has designated one of our own members to read the address which Dr. McGuire has prepared, and it is a pleasure to be able to call on Robert L. Woodard, of Hopkinsville, to read the address to this audience, otherwise we would have been greatly disappointed.

Dr. Woodard then read the address of Dr. McGuire, who selected for his subject "The Surgical Treatment of Certain Types of Dyspepsia."

At the conclusion of the address, the Secretary moved that a telegram be sent to Dr. McGuire expressing the appreciation of the Association for his splendid message which carried so much to every one who heard it; also that the wishes of the Association be conveyed to his brother for a speedy recovery.

Seconded and carried.

THE SECRETARY: Away out in Utah there is one great and grand old man, whom we loved and honored in the long ago, sitting down blind, without any of the vision he used for us through the twenty years he was Secretary of this Association. He was also our presiding officer. Dr. Steele Bailey, one of the sweetest, best and loveliest of men, has lost his eyesight, and tonight he is thinking of us, and I would like to move, sir, that we send him a telegram, expressing our love, affection, sympathy and feeling that we all have for him, and let him

know that this great profession is moved tonight as he is moved at the thought of the great sacrifices made for us through the many years he served us as Secretary. Let us express to him our love and affection in his old age and sympathize with him in his affliction.

Seconded and unanimously carried.

On motion, the Association adjourned until 8:30 a.m., Wednesday, September 21.

WEDNESDAY, SEPTEMBER 21—SECOND DAY—MORNING SESSION.

The Association met at 8:50 a.m., and was called to order by the President.

William T. Briggs, Lexington, read a paper entitled "Diagnosis of Urological Diseases."

Herbert Bronner, Louisville, read a paper entitled "The Diagnosis and Pathology of Bladder Tumors."

Owsley Grant, Louisville, followed with a paper on "Stone in the Upper Urinary Tract."

These three papers were discussed together by Drs. Hoffman, Wheeler, Day, Hamer, Mertz, Keith and Palmer, after which the discussion was closed by the essayist.

J. Rice Cowan, Danville, read a paper entitled "Some Observations Upon Perforation of the Intestine in Typhoid Fever," which was discussed by Drs. McMurtry, Estill, Price, Barrow and Bradley.

THE PRESIDENT: The chair desires to call attention to the presence of a number of the faculty and student nurses of the School of Public Health of our State. We are glad to have you with us. You are our helpmates, and we are glad to see you here today. (Applause.)

SYMPOSIUM ON PEDIATRICS.

In this symposium papers were read as follows:

Philip Barbour, Louisville, read a paper on "Colitis in Children."

Granville S. Hanes, Louisville, followed with a paper entitled "Rectal Affections Observed in Children."

Annie Veech, Louisville, read a paper on "Value of Examination of School Children."

Thomas M. Marks, Lexington, followed with a paper on "Bronchial Asthma."

The symposium was discussed by Drs. Estill, Asman, Duvall, Kinsolving, Morrison, Bruce and Pritchett, after which the discussion was closed by Drs. Barbour and Hanes.

P. D. Gillim, Owensboro, delivered the

oration in medicine, selecting for his subject "The Doctor of Tomorrow."

On motion, the Association adjourned until 2 p.m.

SECOND DAY—AFTERNOON SESSION.

The Association reconvened at 2 p.m., and was called to order by Alice Pickett, Louisville, Vice President.

B. E. Giannini, Kenvir, read a paper on "Pellagra, With Special Reference to the Pathological Evidence of Infection."

The paper was discussed by Drs. Pope, Thornton, Gardner, Joyner and Atkinson, and discussion closed by the author of the paper.

John R. Wathan, Louisville, read a paper on "Surgical Treatment of Goiter," which was discussed by Drs. Moseley, Abell, VanMeter, Case, Keith and Hume, and in closing by the essayist.

In a symposium on malignancy, papers were read as follows:

"Malignancy of the Breast," by J. Garland Sherrill, Louisville.

"Malignancy of the Uterus," by Louis Frank, Louisville.

"Treatment of Malignant Uterine Conditions With Radium," by Woolfolk Barrow, Lexington.

"The Necessity for Early Recognition of Malignancy of the Gastrointestinal Tract," by John H. Blackburn, Bowling Green.

"Malignancy of the Rectum," by Bernard Asman, Louisville.

"Treatment of Malignant Conditions With Radium," by W. J. Young, Louisville.

The symposium was discussed by Drs. McChord, Stewart, Hendon, Anderson, Aud, Abell, Davis, Keith, Price and Leavell, after which the discussion was closed by Drs. Sherrill, Frank, Blackburn and Asman.

The President read the following telegram from Dr. Seale Harris, Secretary-Editor of the Southern Medical Association:

Greetings to the Kentucky State Medical Association. Hope you are having a most successful meeting. We can never forget the wonderful meeting you gave us last year in your good State, and we hope a very large number of your members will go to Hot Springs in November to help make this year's meeting another great success. Please invite them and urge them to go.

On motion, the Association adjourned until 9 a.m., Thursday, September 22.

SEPTEMBER 22—THIRD DAY—MORNING SESSION.

The Association met at 9 a.m. and was called to order by Alice Pickett, Vice President.

W. M. Brunet, New York City (by invitation) read a paper entitled "The Present Treatment of Syphilis With Especial Reference to the Efficacy of Modern Methods."

At the conclusion of the paper the Secretary moved that a vote of thanks be extended to Dr. Brunet for the very remarkable presentation he had made of this subject.

Seconded and carried.

L. K. Baldauf, Louisville, read a paper on "The Wassermann Reaction in Syphilis."

H. J. Farbach, Louisville, followed with a paper on "The Treatment of Neuro-Syphilis."

These three papers were discussed together by Drs. Palmer, Graves, Pope, Gardner, Hancock, Solomon and Stucky, after which the discussion was closed by Drs. Brunet and Farbach.

J. T. Case, Battle Creek, Michigan (by invitation), read a paper entitled "X-Ray Aspect of Chronic Small Intestinal Obstruction," which was discussed by Drs. Keith, Solomon, Pope, Jasper, Hendon and Willmoth, and in closing by the essayist.

Lillian H. South and Irvin Lindenberger, Louisville, gave demonstrations of the Schick test and other features of laboratory work.

On motion, the Association adjourned until 2 p.m.

THIRD DAY—AFTERNOON SESSION.

The Association reconvened at 2 p.m. and was called to order by the President.

Alice Pickett, Louisville, read a paper on "Immediate Repair of Lacerations Versus Delay," which was discussed by Drs. Redmon, Doherty, Speidel, Clark, Price and Gaddie, after which the discussion was closed by the author of the paper.

L. C. Redmon, Lexington, read a paper on "Various Methods of Performin Cesarean Section, With Indications and Contra-indications," which was discussed by Drs. Lukins, Howard and Frank, and in closing by the essayist.

Edward Speidel, Louisville, read a paper on "A Discussion of the Newer Fads in Obstetrics," which was discussed by Drs. Davidson, Doherty, Fort and Pickett and discussion closed by the essayist.

Morris Flexner, Louisville, read a paper on "Three Cases of Multiple Sclerosis With a Review of the Recent Literature," which was discussed by Drs. Moren, Gardner and Pope, and in closing by the essayist.

John J. Moren, Louisville, read a paper on "The Diagnosis and Treatment of Encephalitis," which was discussed by Dr. Pope, and in closing by the essayist.

THE PRESIDENT: I take this occasion to express my very deep appreciation of the very great help that you have given me in the conduction of what I believe to be one of the biggest and most successful meetings of the Kentucky State Medical Association. I predict for the coming year a larger constructive work than has ever been done by this Association. We have been evolving for a year or two along certain lines. Now, reconstruction begins.

I congratulate you on the officers that have been selected and elected to guide you next year, and if you give them the co-operation that you have given me, and if we all put our shoulders to the wheel, I am sure we will have a great meeting.

Curran Pope moved that a vote of thanks and appreciation be extended to Dr. Stucky for his courteous, fair and extremely nice management of the meeting.

Seconded and carried unanimously by a rising vote.

As there was no further business, scientific or otherwise, to come before the meeting, on motion, which was duly seconded and carried, the Association then adjourned to meet in Paducah in 1922.

ARTHUR T. M'CORMACK,
Secretary.

Effect of Vaccination Against Influenza.—The prophylactic effect of a widely used vaccine containing Pfeiffer bacilli, streptococci and pneumococci has been studied clinically and statistically by Jordan and Sharp. They recorded during a period of about seven months the respiratory ailments which developed among 6,066 persons, approximately half of whom had received the vaccine. Some of these were attacked by influenza in the 1920 wave, which occurred within two months of the vaccination; in addition, the usual number of pneumonia and common cold cases among those observed afford material for comparisons.

OFFICIAL MINUTES OF THE HOUSE
OF DELEGATES OF THE SEVENTY-FIRST ANNUAL MEETING
OF THE KENTUCKY STATE
MEDICAL ASSOCIATION,
HELD IN LOUISVILLE,
SEPTEMBER 19, 20,
21 AND 22, 1921.

SEPTEMBER 19—FIRST MEETING OF THE
HOUSE OF DELEGATES.

The House of Delegates met in the Leather Room of the Seelbach Hotel and was called to order at 2 p.m. by the President, W. W. Anderson, Newport.

R. J. Estill, Lexington, was called to take the chair temporarily.

THE ACTING CHAIRMAN: The first order to the report of the Committee on Credentials.

C. G. HOFFMAN: The Committee on Credentials desires to report that they have inspected the roll in the hands of the Secretary; that the roll is made up of accredited delegates from the various medical societies.

THE SECRETARY: I move that the roll as reported by the Committee on Credentials be the roll of this House of Delegates for this session.

Seconded and carried.

The Secretary called the roll.

President Anderson resumed the chair.

THE PRESIDENT: A quorum being present according to the announcement of the Secretary, we will proceed with the transaction of business.

We will listen to the reading of the minutes of the session of 1920.

VIRGIL E. SIMPSON: I move the reading of the minutes be dispensed with inasmuch as they were published in the Kentucky Medical Journal for November and December, 1920.

Seconded and carried.

THE PRESIDENT: Report of the Committee on Scientific Work by Dr. Owsley Grant, Chairman.

THE SECRETARY: I desire to report for the Committee on Scientific Work the program that is now in your hands, and move that it be the official program of the seventy-first annual meeting of the Kentucky State Medical Association.

Seconded and carried.

THE PRESIDENT: Report of the Committee on Arrangements, J. K. Freeman.

THE SECRETARY: In Dr. Freeman's

absence, I will say that the arrangements include a public address to be delivered tomorrow night in the main auditorium upstairs.

Unfortunately a telegram received this morning states that Dr. Stuart McGuire has been detained by the impending death of a member of his family, and a future announcement will be made in regard to the oration.

On Wednesday evening, at 7 o'clock, in the main dining room of the Seelbach Hotel, a banquet will be tendered to the Kentucky State Medical Association by the Jefferson County Medical Society. This will be one of those delightful entertainments for which the medical profession of Louisville is famous.

Arrangements for the visiting ladies will be announced later by Dr. Freeman.

THE PRESIDENT: Is there any further report from the Committee on Arrangements? If not, we will accept the report as made by the Secretary.

Under reports of officers, your President begs leave to report his presence. You are not greatly interested in the setting sun. There will be no further report from the President. The active work of the year has been done by the President-elect.

We will now listen to the report of the Secretary.

REPORT OF THE SECRETARY.

THE SECRETARY: Mr. President and Members of the Association: I have not reduced my report to writing as usual because a number of things were in process of completion, and for that reason I ask your forbearance while I tell you a few things that are pressing for solution in connection with our work during the past year.

In the first place, I think that many of our county societies are doing poorer work than they have ever done since the State Association has been organized. There have been fewer regular meetings of some of the best societies and none of the worst, and from these two extremes there are all grades. Now, there is no reason for the existence of this Association at all unless we are going to have regular meetings of the county societies, unless the societies are going to do something, unless they are going to functionate. We cannot hope to continue to progress and continue the prestige of this Association without regular meetings of the county societies which are our component parts, and this

Association is a failure unless it can do that.

I have attended two meetings called by the American Medical Association to discuss this important question, because we are in the same condition apparently as practically all the other states are, and two suggestions have been made in regard to it that are worthy of our attention.

In the first place, the American Medical Association has recommended to the State Associations that arrangements be made for such post-graduate work to be carried on in the county societies as will be found practicable in each state. In connection with this suggestion the United States Public Health Service is at present holding institutes in some thirty sections of the United States, where the Service will furnish a portion of the faculty, and where the remainder of the faculty will be provided by our profession in the neighborhood or locality. It has seemed wise to me, and I desire to recommend very strongly to the Association, that we make arrangements with some one who has had experience as an extension educator, who can organize in the different sections of the state at least one in each councilor district, during the year, a week or two weeks medical institute, where the members of these sections may gather together from time to time, and where they may be appealed to in order to give the latest practical developments in medicine and surgery. In this way the state associations will carry to the physicians in their own neighborhoods the practical advances that needs to be made in the practice of medicine. This is the more important, my friends, because we are confronted in Kentucky with a real crisis in the treatment of the sick—a crisis that has two different elements. In the first place, there is a real scarcity of doctors in the country districts of the state. We have fewer doctors today practicing medicine in the country than ever before. It is easy to say that this is largely due to the fact of doctors moving into towns, on account of automobiles and good roads, but you and I know that this does not apply to Kentucky. They may be moving into towns, but not on account of good roads, because we have no good roads in the country. There are practically no roads in the state that will enable a doctor to treat his country people comfortably and effectively outside of the Bluegrass Region.

Many sections of the state have a real

shortage of doctors. That condition may not be remedied in our day, but we must address ourselves most seriously to it.

In the next place, we are not graduating half of the physicians we graduated ten years ago. It takes seven of those now graduated to make one of those that graduated then. The majority of those graduated today become specialists, which is due to a misconception of medical education that has taken place up to the present time, and it is only now in process of being remedied.

It is wise to plan for group practice in the centers because group practice is the only solution, in all probability, of the modern scientific treatment of many complicated cases. But group practice will never deliver a woman; group practice is never going to reduce the high death rate of diphtheria; group practice will not take care of typhoid fever, and we will have more than 17,000 cases of typhoid fever in Kentucky this year. As long as these things are happening, as long as we are treating people in that condition, something else has to be done. We have got to have individual practitioners in our rural districts. This year we will have a greatly increased number of cases of disease requiring individual care at the rate they are now occurring. We have the first increase since 1910 in typhoid and diphtheria for this year. We are having this unnecessarily high death rate in our country districts and in the little towns where they have no sanitary conveniences, but where they still have the sanitary arrangements of the country.

A suggestion made by Dr. Work, President of the American Medical Association, which has received favorable comment, is that we devise a system of education that will enable us to give not only the degree of Doctor in Medicine, but the degree of Bachelor in Medicine; that the Bachelor in Medicine as in England shall not have the additional training that is necessary for special work, but that he shall be given the basic training which makes him a competent general practitioner. It is of the utmost importance that we understand amongst ourselves, and that the public understand there can be no lowering of medical standards, yet I believe our unit of measurement of medical standards has been an erroneous one. I do not believe for a minute myself, and I think you will agree with me, that the present standard is a proper means of measurement of a man's ability to study medicine

which says that he shall devote so many days, so many weeks, or so many semesters to the study of any subject. It should be determined when he has arrived at the position where he knows these subjects sufficiently well to pursue the higher branches in the study for the practice of medicine.

Another tendency of our medical schools which seems erroneous to which we should direct our attention, is the emphasis that has been placed in recent years on the science of medicine, and the almost withdrawal of any teaching in regard to the art of medicine. So far as the average individual is concerned, he cannot be seen by a doctor. We all know that 80 per cent of the people would get well if we did not see them, if they took a cathartic, stayed still and fussed a little bit. It is the other 20 per cent to whom we are of the utmost importance. The important thing to them is not simply the diagnosis of disease, but the treatment of them by the doctors who come into their homes. They do not care anything about how many scientific facts are involved in the case; they want to know what is the matter with them, how they can get well, and the easiest means of getting well. We are greatly emphasizing the means and too little in arriving at the end. In the very best of our practice, it must be made plain to us, and we must understand amongst ourselves, that when a patient comes to us with a boil, there is no reason for making a laboratory examination or an X-ray examination, and other examinations that are frequently made before the boil is lanced. These things are being done and are bringing the profession into disrepute and into ridicule, and we must stop it. It is up to us to see that it is stopped.

In the work of the Medico-Legal Committee during the year we have employed, as we discussed at the meeting last year, an attorney in connection with the State Board of Health, who has devoted as much of his time as we desired to the work. While he has not devoted his entire time, he has devoted all the time in need to the work of the State Association and the State Board of Health in the defense of malpractice cases and the other legal work of the Association in the prosecution of quacks when evidence is secured that will lead to their prosecution. This part of our work I know you will realize is of special importance.

In many of the counties of the state

there are many unlicensed practitioners of the healing art. In Wayne County there are more men practicing medicine today who call themselves doctors than there are legally registered physicians, and that condition is one that in that section of the state will continue to increase in spite of all laws written on the statute books. When people are sick they want doctors to take care of them, and if the doctors are not there they will get others to do it who call themselves doctors. The law is definite and where there is an honest court, it is up to the members of the profession and citizens to secure evidence against the cults or quacks and those that are now attempting to practice medicine. The enforcement of that part of the Medical Practice Law which recognizes the various cults has been one of the most complicated pieces of machinery put in operation in the state. I do not think there is anything in my father's professional career that has been more annoying and has tried his patience so much as the continual nagging during every hour almost throughout the day by these men, many of them ignorant, who want to do their best to comply with the law and do the things that ought to be done.

The optometrists, as a rule, are reputable, and a decent class of citizens. They are business men of character and standing, and there is comparatively little difficulty with them except the difficulty you recognize, namely, changing a trade into a profession, and the evolution from a trade to a profession is a difficult and slow one, and will need our patience and help in bringing it about.

In regard to the licensed chiropractors, I am sure you all recognize that the thing which was done at the time was the only thing to do—that is, the ones who were already admitted in the state were exempted from examination, and those who come into the state hereafter will be given the same examination as doctors in all the fundamental branches. If the first examination can be taken as an indication, they will fail in these fundamental branches, and those examined knew almost as little about the chiropractic subjects, and before licensing them the law requires that they be competent, so that the health of the people may be protected.

Since the last session of the Association a very fine old lady, Mrs. Irvine, grand-daughter of Ephraim McDowell, died at Richmond, Kentucky, and by her

will left her home place, which is one of the handsomest homes in the state and forty city lots adjacent to it, to the Kentucky State Medical Association, with an annuity of \$2,500.00 a year, with the provision that an institution should be established in honor of the memory of her grandfather, Ephraim McDowell. The House of Delegates must determine what shall be done with this estate.

Two suggestions have been made. First, that it be turned over to the Madison County Medical Society as a committee from this Association for the purpose of establishing a local hospital for Madison County. Second, it has been suggested that the State Association take over this home and make it a home for aged and infirm physicians and their dependent families, under the management and control of the State Association itself. That has been the dream of many medical societies for years. Several of them have collected funds for the purpose, and this beautiful home, which is easily worth \$100,000.00 could be used for that purpose, if it is the wish of the Association to so arrange it.

I want to appeal to you gentlemen to help the State Medical Association right now. There is no other organization in the United States or in the world which has been the recipient of such loyalty or such devotion or such sacrifice. It has accomplished so much for the profession and people of Kentucky that we have gotten to the point where it is in serious danger of relying too much upon the great reputation it has achieved in the past. We are doing in many counties less actual work today than we have done before since I have been connected with the Association. Every individual member realizes and knows the love we all feel for it, but we are not working like we used to work before the war. We are not doing the things that need to be done to make this Association grow. We are not having county medical society meetings as frequently as we ought to, and I want to appeal to you to try to do better.

As your official representative, I have been in nearly half of the counties of the state during the past year. I have seen the doctors at home and at work and know we are not doing the work we ought to be doing. I want to appeal to you that our deliberations be so conducted that when we return to our homes, charged with our responsibility, we will be determined to do work for the betterment and the health and lives of

the people of Kentucky and do better work for the physical and material conditions of this great profession, in order that we may be worthy of the reputation our forbears have made for us, and try to make good in a big way. I am sure we can do it if we work hard. (Applause.)

THE PRESIDENT: The Secretary in his report has brought to our attention very important problems that are open for discussion by the House of Delegates. The chair would suggest, as a matter of reaching a conclusion and of expediting discussion, that we take up these matters seriatim.

He has suggested, first, if I recall correctly, the problem of county society work; second, medical education; third, county practice; fourth, medical law enforcement; and, fifth, the McDowell hospital.

Are there any delegates who have anything to say on the county society work? That is something about which we ought to be prepared to speak right out in meeting.

THE SECRETARY: I do not believe it will be necessary for the counties doing little or no work to pile up their discouraging reports of failures, but where the county societies are thoroughly organized and are doing good work it would be an excellent plan for their delegates to tell us how it is being accomplished and what is happening.

F. A. STINE: Like the rest of the societies of which you have spoken Mr. Secretary we are a little dilatory, and the only thing I can see is, in order to improve our society work, to get some young blood as officers. We old fellows have been running our societies so long that I am afraid they are getting tired of us.

JOHN G. SOUTH: I agree with the last speaker, that we should try to do better work. I am afraid I am like many others here in letting the other fellow do the work.

Dr. McCormack has brought up an interesting subject, and one to which we should pay strict attention. Unquestionably we older men in the profession are inclined to neglect county society work. Outside of a few of the largest cities, I do not believe we are doing the work that we should do.

I want to especially call the attention again of this body of delegates to the necessity of having some social features connected with county medical society work. I believe in the counties in which

this has been tried out, where they have had social features connected with the meetings, it has done more good than anything else. Over in Bourbon County and one or two of the bluegrass counties they have had social features at the homes of the different members; they have served refreshments, and by having a little social life mixed with business it has done great good. That is one feature I would like the members to take up and push stronger than ever for it. If we can get together in a social way, we will get together in a business and professional way, and we have got to mix the two.

W. B. MOORE: I was astonished to hear Dr. McCormack's remarks in regard to county medical societies. We have had one of the best years we have ever had in our county society. There are 36 doctors in the county, two of whom are ineligible. We have an attendance of 15 on an average at our meetings, never less than 12. We have always had some one to read a paper at each meeting, and we have had reports of cases from the members. Almost every month we have social features which adds to the pleasure of the meetings very much, and I feel we have one of the best societies in the state.

R. B. CASSIDY: There is one feature that has been impressed upon me that I would like to mention before this body, and that is the state makes us pay for the Kentucky Medical Journal, and when we pay that our members think there we should stop. How to remedy that I do not know. We want the Journal. When I was secretary of our county society, I made every fellow pay up and I could not get a meeting any more. They thought that was the whole thing, and it is the biggest thing of the Association. We cannot get along without the Journal. I am in favor of doing everything that is honorable to help the profession to maintain its present high standings. The Kentucky State Medical Association is like "Liberty Enlightening the World." Kentucky stands forth four-square above everything in the United States in everything medical she has undertaken. She has had the actual experience. This great big boy of Dr. McCormack's is head and shoulders over any of us. As to the elder McCormack, he has done his work. He has lectured everywhere. He has contributed most toward bringing the medical profession up to the standard where it ought to be. I am glad he is still with us. I am told

that he works from 8 o'clock in the morning until 5 o'clock in the evening, and I hope he will continue to do so for many, many years to come. I am for anything that will bring the Kentucky State Medical Association up and put it on a high plane in order to serve us a beacon light that we can follow in blazing the way for higher developments and higher attainments in the medical profession. (Applause.)

ROBERT F. JASPER: I happen to live in a mountain section of the state, the extreme eastern section, on the Virginia border. We have had some excellent society meetings there, well attended, and great interest displayed with gratifying results. Dr. McCormack has been down with us at different times. Dr. Moren was with us, and Dr. Hanes. We have had good meetings. I do not believe that the State Association can functionate and be what it should be unless the county societies are what they ought to be. The county societies in my opinion make the State Association what it is.

There are two or three things, as I can see this, that will build up, create interest, and make the county societies what they should be. First, the elimination of professional jealousy; a right relationship on the part of the doctors in the sections. I believe if we can solve that problem, we would solve one of the biggest problems that we have. Another thing is to put men on the program who will respond and be present and read their papers and create interest, and when you get the interest of the members properly created, you will have the men throughout the locality anxious to be there. It is well to have something special at some of the meetings, and one of the things brought up is the social features to which Dr. South has alluded. I believe at frequent intervals we should have a social, dinner, or supper, and let it be known that there is going to be something special; that we are going to bring some one from the outside to attract attention, and if each individual member is willing to do his part for the good of the society, he will in turn do something for the State Association. When we do that, we benefit ourselves, we benefit others, and we benefit the general public in learning what we can do for the society.

THE PRESIDENT: The chair would suggest one other feature in connection with society work. Dr. South mentioned the social side. There is another social side, a discussion of the social aspects of

medical practice. That is coming to the front, gentlemen, the social aspects of medical practice. Think of it. Think of what the public has a right to demand of us and what it is beginning to demand of us, the something that tends onward towards state medicine. If we do not think about these things and discuss them and lead the thought of the profession and of the people in right lines, it will not be many years before they put us in wrong lines in regard to medical practice.

I see Dr. Moren, and would like to ask him to say something on the subject of the Secretary's report on medical education.

JOHN J. MOREN: I am not prepared to discuss that point. I hardly know what to say. One thing I have reached a conclusion on recently is that we have used entirely too much science and too little common sense. (Applause.)

THE PRESIDENT: We would like to ask some of the college men to talk on this subject as they have been criticised.

DUNNING F. WILSON, French Lick, Indiana: In the first place, I am what you might call a rural practitioner; therefore, I am getting the viewpoint of the man in the country districts, and the great difficulties which confront them with reference to society meetings.

In our particular county (Orange County) there are 23 members of that particular organization, and at one meeting, the first one I was able to get to, there was not a quorum present. We had to go around to a little village and elect a member of the society to get a quorum. At that particular time we took up the matter of organization and tried to find out what was the reason they held back and what was the reason for preventing the country districts or the county societies from having a well built organization. On the surface it seemed to a small number of men that it would be easier if the transportation facilities were adequate, to hold the organization together, make it interesting, make it a friendly organization, as well as an organization for the advancement of our professional interests, and yet that is not true, unfortunately.

In discussing this matter of getting men together to hold society meetings, I would like to mention one or two points, and although they may not be helpful, they are illuminating to me. They all admitted that transportation was satisfactory. They admitted they had at their disposal material which would

make society meetings interesting, but they could not say definitely why interest in these meetings was not elicited. I have myself believed, and have for a number of years past, that each particular organization, no matter whether it happens to be a medical organization or an organization of any other sort, must be developed around certain personalities. Say what you please, gentlemen, the Jefferson County Medical Society, or the Kentucky State Medical Association, or any other organization, is made by a few men who are willing to work, who are willing to put their shoulders to the wheel and to bear the brunt of it. It is very essential to have at least a few good angels or a few good men back of any movement in order to make it go. I have seen fit to try and build up an organization of the Orange County Medical Society, and it improved for a while, and later on I passed the buck, as we do in the army, to some other good angel.

The matter of getting together socially is important. There is one definite thing that stands out more prominently than anything else, and that is the element of social conduct may lead to competition on the part of those men who are playing hosts. If we go back a number of years to our independent organizations, we find the members were entertained this year at one house, and next year they were entertained by another man. Each particular time that the society met the man who was host tried to do something a little bigger and better than the other man, so that it became a burden, and if I speak correctly, it was discontinued because of that very fact. If there can be at least a feast of reason and a flow of soul with a little sustenance for the material man, it is all right, but we should have a social feature which will produce a spirit of co-operation and not have constantly one man vying with the other to outdo himself as host. There should be more cohesion and co-operation among the members, but in order to build up our county organizations the brunt of the work must devolve upon a few personalities who are cohesive, active, forceful, but, nevertheless, always ready to concede the other man's viewpoint and appreciate the fact that in unity there is strength.

THE PRESIDENT: I think the point made by Dr. Wilson is exceedingly well taken in developing the social side. We must beware of the error into which the social side may lead us.

Are there any further remarks on the subject of medical education, or shall we pass on to the problem of country practice and the need of supplying doctors for the country districts, and how to meet it?

A DELEGATE: Has the Secretary proposed any remedy for this matter of education?

THE SECRETARY: The only remedy that has been proposed that I can see any light in at all, the only practical thing, is that we establish the degree of Bachelor of Medicine as well as the degree of Doctor of Medicine; that the Bachelor of Medicine should be as in England, a licentiate who shall be trained as you were all trained in this room. Everybody in this room was trained to practice medicine as well as the profession in Kentucky that has practiced it for the last one hundred years, and such men as desire to prepare themselves for the doctorate degree shall continue to do the special work, the great sanitary work, those branches which are being carried into group practice, and men who devote themselves to specialties, who should learn how to use the instruments of precision that are now being taught. Every student in a medical college today is taught to use the electrocardiograph. Such students might as well study how to use flying machines as they are really more likely to find them more useful in the future than the electrocardiograph. Undoubtedly the electrocardiograph is a useful instrument. It is an important thing, and there ought to be two or three men in the State of Kentucky who are thoroughly familiar with its uses, and the rest of us can send our patients to them so that they use this instrument, if necessary. The same thing applies to many of the things we are now learning. Perhaps there is no more important thing than a knowledge of basal metabolism, and yet it does not seem to me that every man should be taught the technique of basal metabolism. Many men will have neither the time nor the material to do that sort of work and do it accurately. I do not believe every man should become a laboratory technician, because if he does general practice in the country he will use laboratory technic in so far as the acute cases are concerned and he should have the basic knowledge necessary for his interpretation of laboratory reports. In other words, it seems to me, the scientific content of our medical course is be-

ing constantly changed by putting other things in without eliminating some of the things which we already have which are either worthless or unnecessary; that we have added to the medical course until it is beyond the conception of most men. It seems to me, we are trying to make a finished product, and when we turn them out of a medical school we try to turn them out completely panoplied for the entire course of their practice. It was never done in any institution! We can teach a man the basic facts to make him a successful student throughout the course of his life. If we can do that by lessening the content of the medical course, putting emphasis on the qualifications of the man who is to enter school, and putting emphasis on his qualifications when he leaves school, and from time to time along through the course giving him such tests as will indicate the character of training which is being given, we shall have accomplished a great deal. I have realized for a long time we had to have these artificial standards during the educational epoch through which we have passed. The college education of the country is worse than medical education. Medically we do have something definite today, but they do not even attempt to make the college course definite. The content of our medical course cannot be increased as continuously as the content of the college course because there is some limitation on what is taught today in the medical course. I want to appeal to the members of the medical profession to get men interested in medicine, to help get young men to become interested in it when they are fourteen years of age. A young man cannot decide when he is nineteen years of age that he is going to become a doctor and be one. This has got to be determined when he is starting in high school, and when he is fifteen years of age he has to take definite scientific courses if he is going to get there. When we have to reject a man, according to the ruling of the Council on Medical Education of the American Medical Association, who had all the other requirements but had failed to take one hour in a foreign language, it is absurd. This young man had taken one foreign language throughout the school year, but did not take the other, and because of that fact he has to go back to school another year. A young man applied for entrance to a medical college. He is a high school graduate, yet there is no way to get him into a

medical college unless he takes a two-year premedical course. He is 24 years of age. These things have been worked into medicine, and while we approve of the present plan as a theoretically correct standard, as a practical thing the people are not going to stand for it.

Many of you saw a letter recently written by one of the best members we have in the General Assembly of Kentucky, a man who has been there many years from Hardin County. In his letter he starts out with the preamble that there are fewer doctors in Hardin County than there were a few years ago. He stated that if they wanted a case of typhoid fever treated they had to send to Louisville or to Elizabethtown, and it would cost a great deal to send to Louisville for a physician. He further states that there were two deaths in his neighborhood from typhoid fever. These patients had never seen a doctor, and there were other cases of typhoid fever in that neighborhood treated by physicians. They were not able to get nurses. The question is, shall we continue to stick to a system of education which is gradually letting all of the profession get to the top or lessen the content of the medical course so that others may come in at the bottom? There are sixty counties in Kentucky from which there has not been a medical student in the last five years. There are 100 counties today from which there is not now a single medical student. There are only 163 men from Kentucky studying in all of the medical colleges in the United States today. Suppose all of them graduate, and that means 40 a year, and these 40 come back to Kentucky, which is twice as many as come back to the state, taking the entire number, it would mean 40 doctors a year to supply the places of those made vacant either by death or by removal. One hundred and sixty a year has been the average for the last ten years. In view of what I have said, it is perfectly apparent we are not supplying the demand.

A DELEGATE: If every medical college in the country is filled to more than its capacity now, and the same should pertain to the University of Louisville, according to the argument of the Secretary, we have to establish more medical colleges.

THE SECRETARY: That is true. Either that or take the other horn of the dilemma and reduce the content of the

medical course in our present colleges and take care of more men.

W. T. LITTLE: Is it not a fact there are many rural sections in Kentucky that are offering financial inducements to physicians to locate in those sections in which they need practitioners of medicine today. There is another side to the question. These sections are going to be compelled to furnish something in the way of better roads and the necessities that go with life before they can expect to have well-qualified physicians who are raising families to practice in their communities. There is no one factor that is working for the betterment of roads today than the realization of the rural districts that in order to have medical aid they must build better roads. There are few sections in Kentucky today but what have natural road material within two or three miles of any proposed road that is to be built. In my community—and I am doing a rural practice and have for fifteen years—the roads have been bad. In the last year or two we have been trying to bring the people to a realization of the fact that they will soon be without medical aid if they do not have better roads. In the last ten days we have made gravel roads by community aid. We did not wait and argue over the issuing of bonds; we simply announced that we were going to build these roads, and the farmers came in with their wagons, and in twenty-eight and a half days from the time we started we had the gravel pikes finished. We only missed one day, and that was a rainy day. I believe the rural sections will have to do their part if they get medical aid. It is not necessary to lower the standards of qualifications.

VIRGIL E. SIMPSON: It seems to me we have nothing to do with the standard of medical education or with the medical schools. This is the function of the Council of the American Medical Association and of the Association of American Medical Colleges, and we are wasting time unless we devote our attention to things we can handle.

The medical profession in years past has labored in and out of season to raise the standard of medical schools which compelled some of the smaller schools to go out of business, and the type of men turned out were poorly qualified to practice medicine. The fault is not with the medical school, but with those who are making the curriculum of medical colleges, and for that reason we cannot afford to take more men into our schools

than we have today. We must go to the fountainhead which controls the requirements of these educational institutions and see that the standards are so adjusted that they can be met in the way of increased matriculation. One of the great troubles with the medical curriculum is the disproportion of time allotted to this or that subject. For instance, more hours are allotted to surgery than to internal medicine, and it is absurd on the face of it. Only a small number of those who become practitioners of medicine are going to make surgeons, yet we are educating students along the line of specialism, along the line of surgery, at the expense of time they should spend on internal medicine. I do not think we can change this state of things in our deliberations before the Kentucky State Medical Association.

THE SECRETARY: If we are going to bring about a change, it will be initiated right here. The members of the Council on Medical Education of the American Medical Association are desirous that the state associations take some action which will indicate the attitude of the several state associations in regard to this matter, and if the Council on Medical Education has not first-hand knowledge of the problems that are considered by us, they will never know what is going on. We have got to make it plain to them by such discussions as these before they realize the seriousness of the situation.

An editorial appeared in the Journal of the American Medical Association a short time ago giving the number of students that had graduated, and stated that there was no shortage of doctors, and the secretary of the Council on Medical Education states that, although there are a large number of hospitals in the United States without internes, that there is no shortage of doctors. I am referring now to organized hospitals not in the rural districts. We must, of course, continue to raise the standard, but it must be an honest, reasonable standard, in medical education among country doctors and enable Kentucky to move forward rather than backward and attract desirable men from the colleges to go into the rural districts and practice. We must do something, and this matter has got to be initiated by a body like this if we are to get anywhere. It is to be hoped that this House of Delegates, realizing the tremendous need of the people, will be able to formulate some policy or plan to submit to the Council on Medical

Education of the American Medical Association that will enable them to accomplish something.

J. N. McCORMACK: After listening to this practical and valuable discussion, I move that the President appoint a committee of three to take this matter under consideration and report before this session finally adjourns a tentative plan as a basis for discussion with the Council on Medical Education of the American Medical Association.

The Council on Medical Education has tried to do in ten years what ought to have taken sixty years to do. I doubt if there is a man on the Council who could comply with the requirements of the Council on Medical Education. One man at the head of it, a splendid, magnificent man, said he could not pass the entrance requirements and get into a medical college. I think it is time for us to have a frank discussion of these things, and refer it to a committee, the members of which, when the matter is well digested, will bring a report back to this House of Delegates, so that we can make suggestions to the Council on Medical Education who will try to shape things better for us in the future along these lines.

Seconded and carried.

THE PRESIDENT: The new President will announce the appointment of the committee tomorrow.

There were further questions discussed in the report of the Secretary which are open for your consideration if you wish to discuss them. One is the problem of medical law enforcement, and the problem of the McDowell memorial hospital proposed.

THE SECRETARY: I would like the House of Delegates to pass on the suggestion of the appointment or arrangement of extension of medical institutes in the various councilor districts, under the supervision of the councilors, making such appropriation as is necessary to secure the attendance of a faculty for such institutes for one or two weeks as the local profession may determine.

THE PRESIDENT: The chair overlooked that point which is a very important one.

THE SECRETARY: At these institutes the later developments in medicine and surgery will be given, where men will be given actual work of two weeks postgraduate course in medicine, and where the faculty will be arranged from the medical centers and from the local medical profession so that the matter will be brought up-to-date. This plan

has been tried out tentatively in Ohio and has proven most satisfactory. It was done last year in a tentative way. They held a number of institutes, and the result is that this year they will have three all-time men who will devote themselves to the organization of such institutes, carrying on postgraduate work, and organizing the county societies, so they will continue with the postgraduate work after the institute leaves that section.

I would like to move that this matter be referred to the Council with power to act so that we can make arrangements—tentative arrangements—to start the matter and try it out and see how it works.

Seconded and carried.

THE PRESIDENT: Does any delegate wish to say anything on the subject of medical law enforcement, or in regard to the McDowell memorial hospital? The latter was sprung on us so suddenly that perhaps we are not quite ready to consider it. Will it be agreeable to have action postponed until a later meeting of the House of Delegates, so that we can all be thinking about it?

WALTER BYRNE: I move that the Council be authorized to act in this matter and decide whether it is to be a hospital or a home.

Motion seconded.

THE SECRETARY: Before that matter is passed or voted on, the Council ought to be advised by the delegates some time during this meeting as to this matter. If a home for aged and infirm physicians and their dependents is to be established, there are two practical plans. One practical plan has been suggested, and another which is impractical. Two physicians of Richmond, married men, have offered, if such an establishment is started, to become caretakers of the home, in order to get a home in which to live, and to care for it at the regular rate any doctor or doctors' widows who should be sent to them. This can be done, of course, at comparatively little expense to the Association. There would be some expense. We cannot expect to get anything worth while for nothing, and it is a question whether the members of the Association care to undertake such a responsibility. It looks like too good an opportunity to miss, and it is certainly worthy of serious consideration. It is a matter that the members of the Council have discussed a great deal, and yet I

know from what they say they would like to know from the delegates what they think of the matter. Dr. Dunn, who represents Madison County, is here and can tell you more about the character of the property than I am able to do, and I am sure the delegates would like to hear from him on this subject.

J. F. DUNN: The house that Mrs. Irvine bequeathed in her will is an old-fashioned colonial residence. I do not know how many rooms there are in it, but it was built many years ago, but I do not think it is designed very well for a hospital, but I do not know whether such additions can be made to it to make it a hospital or not. As a residence, it is all right. It would be a pleasant home, and then later on, if a hospital addition can be added to it or built to it, all right. The grounds are beautiful. There are some seventeen or twenty acres of ground, with beautiful trees, and it is one of the nicest places in Richmond.

WALTER BYRNE: A few years ago—I think six or eight or perhaps ten years ago—there was a fund started for a similar purpose, and I would like to ask the Secretary to tell us something about that if he can.

THE SECRETARY: We passed a resolution to establish such a fund, but a change in the by-laws obliterated that fund. A certain amount was set aside for that fund. Campbell-Kenton County Society had a blind doctor whom it assisted. One or two other societies have had similar funds. It appeals to me that it would be a great thing for the profession to have a place where a man who has become so unfortunate as to be unable to maintain himself in old age, or who is disabled in his profession, can be cared for with the Christian spirit which belongs to our profession. It appeals to me strongly, and I do not know how it appeals to you. I would like to know how the profession feels about it.

VIRGIL E. SIMPSON: Why not refer it to the Council, have them discuss it, and then make a report at the last meeting of the Association as to what plan they propose.

The motion of Dr. Byrne was put to a vote and carried.

THE PRESIDENT: We will request the Council to report its judgment in this matter at the last session of the meeting.

Having concluded our discussion on the report of the Secretary, shall we have the report of the Treasurer?

THE SECRETARY: I move that the

report of the Treasurer be passed temporarily.

Seconded and carried.

THE PRESIDENT: Is the Council ready to report?

THE SECRETARY: The report of the Council was published in the Journal, and I think it ought to be read.

In the absence of Dr. McChord the report was read by L. H. South. (See Kentucky Medical Journal, September, 1921, page 542.)

THE PRESIDENT: You have heard the report of the Council. Have you any action to suggest? A motion that it be accepted is in order.

E. N. HALL: I move the report be accepted.

Seconded and carried.

THE PRESIDENT: Reports of councilors by districts are next in order. Is the Councilor of the First District ready to report?

REPORT OF COUNCILOR OF THE FIRST DISTRICT.

W. W. RICHMOND: I have not a written report. I usually have had one heretofore. The reason I have not a written report is because of the condition of my health in the past year. I have not done as much Councilor work the past year as I have heretofore. I want to say, however, that our councilor district is in as good condition as ever. I think I have sown the seed for good work among the doctors in my Councilor District. I got a letter from the Secretary ten days ago to the effect that the First District had lost ten members. I do not know whether we have made up that shortage of ten members or not. If we have not, I want his advice. All things considered, we have a larger membership this year than last. Since the world war doctors all over the state have changed locations. Many have gone from one county to another, and while there has been an increase in membership in some sections, it has decreased in others. There is the same enthusiasm in the First District as formerly prevailed from the standpoint of professional organization, and I believe our men are doing as good, if not better, work than is being done in some of the other counties of the state. Our doctors are all energetic, and are all doing good work. Meetings have been held regularly, and I predict an improvement in the work they have been doing.

THE PRESIDENT: Dr. Richmond tells

us that he has not been in good health, but his district shows a larger membership this year than last year. We do not wish Dr. Richmond to stay sick, and that he will not continue to do less valuable work than he has done in the past. It suggests this practical thought brought out by the talks made with regard to some of the county medical societies a moment ago, that the man about whose personality great work centers should have an understudy. The great prophet Elijah, when his time for passing came, was ready and had a man ready on whom to bestow his cloak. The work should not fail because one man failed or because he becomes ill and moves away. There should be an understudy who will take up the work, and one of the things that we hear is that the local organization has failed to find a man who can take up the work in that section of the state.

Dr. Richmond has done wonderful work not only in his district for many years but his work has been an inspiration all over the state.

REPORT OF THE COUNCILOR OF THE THIRD DISTRICT.

E. N. HALL: Like Dr. Richmond, I have not a written report. The third district is in fair condition. I made several visits to counties in the district and held meetings there. Some of the meetings have been splendid ones. The Hart County Medical Society held a meeting in April which was one of the best I have ever attended. I do not believe we have fallen off in membership. I believe we are on the increase. Dr. McCormack asked for an increase in membership, and it ought to be done. We ought to increase our membership each year. The resolutions of the men in my district have been splendid, and they all promise better meetings in the future. I feel we are going to have a better feeling for the accomplishment of greater and more scientific work. A plan has been adopted at each meeting that the Secretary shall formulate a program and require all essayists to report then whether they will be on hand or not to read papers, and we think that plan will work out admirably. I feel we are in a better condition than we have been, and I am looking forward to better meetings of the societies in my district. In Hart County we are to have a meeting on the co-operative plan—that is, a meeting consisting of laymen and doctors. We will have an all-day meeting with a dinner on the

ground, and I predict that we will have as good a time as we had last April in Hart County, when, as I have said before, we had one of the best meetings I have ever attended.

REPORT OF COUNCILOR OF THE EIGHTH DISTRICT.

J. E. WELLS: There are about 400 physicians in the Eighth District. Of this number 274 have paid their dues for this year, an increase of 30 over last year.

September 1 I addressed a letter to each secretary in the district, asking for a report, and these figures are made up from that report. I see from this month's Journal that the report for the Eighth District shows a decrease.

In July I addressed a letter to each of the non-members asking them to see their secretary and pay their dues, or join their medical society. I received a number of replies saying that they had complied with my request. This, I think, accounts for the difference in the report in the Journal and my report.

In the counties of Bourobn, Campbell, Kenton, Grant, Harrison, Mason, Scott and Fleming, the interest is very good. Harrison, while not the largest society, is perhaps the best, not having missed a meeting.

I had the pleasure of meeting with the Fleming County Society in July. The afternoon was taken up with papers and discussions, Dr. Dowden, of Louisville, being the principal speaker. After an elegant 6 o'clock dinner, an evening session was held, to which the public was invited to hear Dr. Hancock, of Louisville. Judging from the interest shown by the members of the Fleming County Society it will soon be one of the best societies in the district.

Bracken County has no organization, notwithstanding the fact that I have organized and reorganized. It is the only county in the district that does not maintain some kind of organization. Six Bracken County physicians have paid their dues this year to the State Association.

The counties of Jessamine, Nicholas, Pendleton, Robertson and Woodford maintain an organization, but do not meet regularly and take but little interest.

During the year I have kept in touch with the officers and many of the individual members of all the societies in my district by correspondence and other means. I regret exceedingly that the

interest in most of the counties is not as good as it should be. Just where the fault is I am unable to say. Possibly I should have made a greater effort to have visited the different counties, but have ever been ready and willing to make visits to them and do what I could to increase the interest. The secretaries have so understood it, but have failed to arrange meetings for me.

Many of the counties have splendid secretaries, but it takes the co-operation of the individual members to make a good society. However, the Secretary can do much to increase the interest in his society by arranging special programs, and now and then a lunch to improve and stimulate the social as well as the scientific interest.

It is humiliating to me to have to report so little interest in so many societies, and I sincerely hope that during the coming year, with the assistance of those that are really interested in making a good society for their counties, that we will be able to create a better and more substantial interest and succeed in enrolling many of those who still remain out in the cold.

REPORT OF COUNCILOR OF THE TENTH DISTRICT.

R. J. ESTILL: I suppose the problems in the Tenth District are not different from those in any other district, but the Tenth District is essentially a rural district. Starting, as some of you know, at Lexington at the apex of a triangle, it spreads to West Virginia and the Virginia border. I have been in all these counties this year except four. So far as I can find out, Owsley, Menifee, Knott and Wolfe counties do not seem to have any doctors, because I cannot reach them through the mails. I have not waited for invitations to go to any of these places. I have written them that I was coming, and it has been my observation that the success of a county society depends on a wideawake secretary. In one county I wrote the secretary that I was coming a week before the meeting time. I arrived there, it being a night's journey from Lexington. The secretary, three or four days after receiving my letter, decided he would go away on a vacation. He said nothing to any one about the meeting, and the members in the town did not know it was time for a meeting, and it was only with the help of one of the doctors, who is a live wire in that town, that we got the physicians together and had a first-

class meeting. We at once discharged the secretary and elected this man as secretary, to whom I have referred as assisting me in getting the doctors together, and he assured me that every month hereafter they will hold a meeting, and I believe they will. Some of the other counties it is hard to get to on account of the condition of the roads, particularly in the winter months. In Bath County the doctors are scattered all over the county, and unless the weather is good it is difficult for men to get together to hold a meeting. Another problem they face is writing and getting essays for the meetings. It is a hardship to a good many of them. They are busy practitioners; they are oftentimes away from home two or three days at a time, and we have adopted another method of getting them interested in county meetings, and that is, we have two plans of proceeding. The first plan is that of simply requiring a case report from every doctor present. They are not to formulate a written report at all, but simply every doctor has to get up and report a case that he has seen. They may be ordinary cases, but still they are cases, and these cases are to be discussed by every doctor present. We had such a meeting in Montgomery County at Mount Sterling, and there were fifteen members present. We started about 7:30 in the evening and closed the meeting at 11:30. Certainly to me, it was one of the most interesting meetings I have ever attended anywhere. Every doctor present reported a case. They were not unusual cases, but cases such as we see from day to day, and there was a free discussion of these cases. I have suggested this plan to many county societies and their secretaries have taken it up. This is the end of my first year as Councilor of the Tenth District, and I feel I am only getting acquainted with the doctors in the various counties. Next year I hope I will be able to do more. They need men and I am going to try and be one of them and help them in their individual and collective progress.

I think probably I am the only councilor in this Association who has the honor of having a county named after him in his district. (Laughter.) I am not particularly proud of my county, however, because we have no organized society in Estill County. I have been over there a couple of times and we have six live doctors who have assured me that if I come back and bring Dr. Stucky and Dr. McCormack with me, they will

organize a society and have a wide-awake one, and I believe they will. As I have said, this my first year as councilor, and I hope that in the next four years of my work I will accomplish a great deal more than I have during the first year.

THE PRESIDENT: Report of the Councilor from the Eleventh District.

THE SECRETARY: Dr. Lock is not present. Before we pass the subject of reports from councilors, I want to say that I have been rejuvenated by following Dr. Estill's work in the Tenth District. He has done the kind and character of work like Dr. Richmond, Dr. Aud and Dr. Wells did when they were boys, and he has restarted the Tenth District in a splendid way. He is doing splendid work, and it is certainly gratifying to know about it and to call the attention of the profession of the State to it. I do not believe any man, who has been a member of the profession in this State, has done a better year's work than Dr. Estill has this year. (Applause.)

THE PRESIDENT: Before taking up the reports of delegates by counties, we will pass over to tomorrow's program, for this is an opportune time to hear the report of the Committee on Workmen's Compensation Law, by Dr. Sherrill.

REPORT OF THE COMMITTEE ON WORKMEN'S COMPENSATION.

J. GARLAND SHERRILL: The Kentucky Workmen's Compensation Law was passed by the General Assembly in 1916, and as amended provides such medical, surgical and hospital treatment, including nursing, medical and surgical supplies and appliances, as may reasonably be required at the time of the injury and thereafter during disability, but not exceeding ninety days nor exceeding a total expense to the employer of more than one hundred dollars on account of the benefits provided by this section, unless the Board shall, by order made within that time, direct an extension of said period of treatment or direct an extension of said limit of expense to not exceeding two hundred dollars, to cure and relieve from the effects of the injury shall be furnished by the employer, and, in case of his refusal or neglect reasonably to do so, the employer shall be liable for the reasonable expense, within the limits of this section, incurred by or on behalf of the employe in providing the same. In the event of an emergency, the employe shall have the right to call in any available physi-

cian or surgeon to administer such first aid as may be reasonably necessary at the expense of the employer within the limits of this section.

This Act was evidently based upon the belief that there was a large economic waste in the manner in which compensation for injuries was administered and adjusted under the law previously existing. In the different states laws upon the same subject have been enacted differing somewhat in method of handling such compensation. We recognize the fact that such a law as first passed necessarily fails to meet some of the requirements, and therefore needs amendments from time to time to meet existing conditions. We also realize that it is a very difficult thing to properly adjust compensation for the workman and costs to the employer, so that it will work a hardship in neither case.

It seems to your committee that in the preparation of this law but little real consideration was given to the proper remuneration of physicians, nurses and hospitals for the care of the injured. This in a measure was due to the fact that the members of the medical profession either were not aware of the provisions of this law, or were not awake to its injustice. We readily understand that the insurance companies who protect the employer against the form of loss, of necessity endeavor to make a rate sufficiently low to be attractive to said employer, and in doing so of necessity wish to limit in every possible way the amount expended in compensation to the employe. There is no reason, however, why the medical profession should be asked to carry the major part of the expense of the care of the injured employes, which is the case under the present Act. Any fair-minded person giving this proper consideration will readily see the propriety of this contention. For instance, a fracture of the thigh bone—an injury which occurs somewhat frequently in manufacturing establishments—the ordinary allowance would be \$100.00 for medical, surgical and nursing care, with the extreme outside allowance of \$200.00 for this care in case the Board so directs. The minimum charge for ninety days in a hospital at \$2.00 per day's board is \$180.00; surgical dressings from \$10.00 to \$30.00; nursing care at \$5.00 per day for one nurse and \$10.00 per day for two nurses, which in complicated cases may be necessary—will more than take up the en-

tire amount allowed as remuneration for such care, without any sum being left for the payment of the physician or surgeon in attendance.

It has been customary in such cases for the Board to pro rate the charges and make a reduction on each bill for such service. This seems to be unjust for the reason that a hospital, while not a money-making institution, but a servant of the public (unless it be a city or State institution), should not be asked to stand a loss in taking care of the injured employe; neither should a nurse be expected to work in such a case without due and proper compensation; and moreover, notwithstanding the fact that the medical profession has always been altruistic and ready to aid the indigent injured without charge, there is neither justice nor right in providing a law which does not properly compensate the attending physician or surgeon.

We understand that this law as at present in operation does not provide for full compensation either for the employe or for the necessary attention that he shall receive. As a matter of fact, it seems that the employe is not protected under the provisions of this law as well as he should be, because owing to the limit placed on the compensation of the physician, hospital and nurse, the employe is forced to assume the remainder of the charges incident to his recovery; and while he feels that he is protected by the Workmen's Compensation Law, in fact he has but very slight protection. Believing that he is protected by the law, the adjustment of claims against him for additional services on the part of the physician, hospital or nurse, becomes very difficult.

Upon the whole, the law as it stands at present is by no means fair either to the employe or to those who care for him during his period of disability.

Your committee has known of a number of cases where, because of the skill shown by the physician or surgeon in the treatment of a case, the disability of the patient was minimized, and a considerable saving of time for him and money to the employer resulted; yet in such cases, and because of the fact that the employe receives small compensation, the Board has assumed the right to reduce the charges of those in attendance upon the employe, which we consider a matter of supererogation and without justice to the parties concerned.

In some other states the medical profession has received a fairer compensa-

tion than has been shown in Kentucky.

We therefore recommend that a proper amendment to this law be drafted for presentation to the next Legislature, which shall cover the salient features mentioned herein, and which shall take away from the Board of Compensation the power to reduce any physician's bill within the limit of the law without providing him with an opportunity for a hearing before such ruling is made.

THE PRESIDENT: You have heard the report of this committee. What is your pleasure concerning it?

C. C. HOWARD: I do not know that I can add to this report anything of value except to say that I heartily endorse the suggestions made by Dr. Sherrill. I have had considerable experience in this class of work. In our county we have minimum amounts. We have had a number of cases at the hospital where we have had the bill or bills automatically shifted as regards the payment of them, just as Dr. Sherrill mentioned in his report. There is no justice in that. If these companies were paupers it would be a different matter but they are not, and well able to pay and meet the requirements, and the company does not pay the same amount of premium whether they pay the doctors or not. A greater premium is paid and I happen to know it will not work a hardship and it will not increase the premium rate to a considerable sum from the coal company or the manufacturer or mill, or whoever works in the mill, that it will increase the compensation of the doctors to a sum that would make it reasonable, fair and just.

I heartily endorse the report as it stands.

THE PRESIDENT: Is there any further discussion?

C. C. GARR: I have a good deal to do with these compensation cases in connection with mines, and there is another feature to it that is bothering to busy doctors, namely, that the paper or report is required to be filled in triplicate and the bill itemized in a certain way. If you take a patient who is in a hospital for three months you may have to X-ray him a couple of times; you may have to operate on him a couple of times. We had such a case of osteomyelitis following a fracture. You treat that patient as you would treat a private patient. You may send him a bill for \$200.00 or whatever the amount of your bill may be. In spite of that, the Compensation Law requires you to put down the num-

ber of visits and charges and number of operations, the number of X-rays taken, assistants, etc. All of them makes the bill amount to a considerable sum, and we have to put down the number of visits at a dollar a visit or leave off the visits. That I think belongs to either the employer or to the insurance company. I do not think it is necessary for us to use our own stenographer to fill out such triplicate forms for them when they could have as many copies made as are necessary. In sending out one form gotten up by the Workmen's Compensation Board, I find they will send it back to be made out in triplicate. That is unjust, and I heartily approve of what Dr. Sherrill said in this regard.

C. C. HOWARD: I had the same question come up as Dr. Garr had. I told the company if they did not want my services with a bill that was not itemized, they could get some other doctor. I sent them a statement the same as I would send any other patient, and they paid the bill.

THE PRESIDENT: A physician in my own locality had some trouble about getting his fee. He informed the company for which he did most work that he was ready to serve them, but they would have to guarantee the payment of such bills as he rendered; that he was willing to give the reasons for his bills and so on, but that he would not cut down his bill for services, and if there was any deficit in what the law allowed, the company would have to make it up. He still does the work for that company.

WALTER BYRNE: Down in our section of the State I decline to have anything to do unless I am sent for by the individual concerned. There are a few doctors in our section who have been taking contracts from insurance companies and permitting them to dictate as to what the services were worth. The bulk of us have declined to have anything to do with such companies.

We had a case in which one doctor gave something like \$450.00 worth of service, and the insurance company had the board decline to pay his bill and he brought suit. The patient was an employe of the telephone company, and I am glad to say that in a short time he received his full compensation of \$450.00 for attending the case. The doctors in our community refuse to be dictated to by insurance companies and decline to have anything to do with them.

I had a company from Kansas City send to me a list of their fees for doc-

tor's services. I wrote to them stating that I was not in the habit of having outsiders make my fee, and I declined to accept them. They told me to go ahead, and I have collected my fees since.

C. C. GARR: I feel rather strongly on this compensation business because it is a matter that concerns all doctors. I think we ought to take a very definite stand in regard to this matter. I get letters all the time from well-known insurance companies particularly in which they not only write to me, but to their legal representatives in my community, and the legal representatives would call on me and say, "I have your bill here, and I notice you have charged \$3.00 for an office dressing." I told him, of course, I charged \$3.00 for a dressing. If it is a large dressing, that is what I charge. He said, On your bill you have charged \$10.00 for an X-ray picture, and he showed me a letter from an insurance company in Chicago stating that they can have X-ray pictures made for \$5.00. I told him I did not make an X-ray picture usually for a private patient for \$5.00; that we charged \$10.00 for an ordinary picture. We do it for nothing for people who are worthy. I think an insurance company should pay no more and no less than a private patient pays in their community. The part that is particularly obnoxious to me is sending a legal representative to tell you that you charge too much, and I have told them that if they did not want me to do the work, not to send their patients, as I would not reduce fees. Then they say, we will have doctor so and so, and usually he does not send bills in at that time.

Another time we may receive a letter to make a visit to a patient with a sprained ankle or something of that kind, and we strap up the foot and charge \$3.00 for the visit. The lawyer says the doctor did not do anything but strap the foot, and that charge is excessive. I think what affects me affects every other doctor, and we ought to take a definite stand against it and have the matter corrected.

THE PRESIDENT: Gentlemen, does not this whole question of adequate provision for the physician under the Workmen's Compensation Law bring to our minds the thought that we failed to exercise our influence in the formation of that law? Ten years before the Workmen's Compensation Law was passed in the State of Kentucky I advocated the passage of a law of that nature and

asked the physicians in the society where I read it to exercise their influence to get the law passed, which would not only man, but the rights of the physicians, for the workmen's rights are not adequately safeguard the rights of the working safeguarded unless the physician's rights are safeguarded. We have not been at work early on this question as we should have done, and it is just so with every other medico-social question. We arrive two years behind the times, and the mischief has been done, and we have a strenuous time to correct the mischief, and let us be awakened and know what is in front of us and guide these things rather than protest about them afterwards. While a protest is well taken, we will not have so much protesting to do if we do a little more guiding.

Are there any further remarks regarding the Workmen's Compensation Law? If not, we will listen to the report of the Committee on Medical Education.

REPORT OF THE COMMITTEE ON MEDICAL EDUCATION.

To the Members of the House of Delegates of the Kentucky State Medical Association.

Sirs: Your Committee on Medical Education is forcibly impressed with the need for an increase in the number of students in our medical schools. The statement that enough students are graduating annually to fill vacancies in rural communities caused by death, removal to cities and retirement from practice of the superannuated is false, otherwise there would not be the number of counties in this and other states in which there is not a single reputable or regular practitioner. Nor would the average age of practitioners in rural communities be over sixty years, as it is today.

There is one remedy for the shortage of medical students which might be suggested. Every practitioner should familiarize himself with the requirements for beginning the study of medicine, viz.: four years high school and two years college pre-medical preparation. During the latter period physics, chemistry, both organic and inorganic, biology and English must be studied. Hence it is during the early high school period that the boy or girl must be interested in medicine as a career. They must be guided early, and must attend a college of arts and sciences, not a normal school, for the pre-medical work. A student may have had two years of college work, leading to a strictly literary degree, yet

unless he has had the subjects enumerated above he must attend college for a longer period in order to acquire a knowledge of them. The Medical School of the University of Louisville is co-educational.

Medical education in the State resolves itself into a study of the University of Louisville Medical Department, the only medical school in the State. This school is ranked in A class by the Council on Medical Education of the American Medical Association. It is a pleasure to announce that the Board of Trustees have authorized the employment of three additional all-time pre-clinical professors in anatomy, pharmacology, and bacteriology with technicians for each department. The Board has appointed Dr. P. J. Mull, an alumnus of the university, as Professor of Anatomy, and Dr. W. F. Clayton as Professor of Pharmacology, the other position not having been filled as yet.

We commend the activities of the Alumni Association of the university and its liberality in donating for teaching purposes a basal metabolism outfit and an electrocardiograph.

The annual clinic week in honor of the Alumni Association is an event looked forward to by a large number of practitioners from this and many other states. The Summer Graduate School planned for the early part of the summer was abandoned, as so few practitioners found it possible to attend.

The closer relationship of the school and hospital, made possible as never before by the appointment of the Dean of the school as Superintendent of the Hospital, has resulted in the greatest good to the students. The Senior Medical Class has all of its work, clinical, laboratory and didactic in the hospital, privileges afforded by but few other teaching hospitals, and in contrast to what obtained when most of us were students.

We believe the aims of the faculty and dean are being realized, that students are now being graduated as general practitioners of medicine, not as specialists or teachers, with a well-balanced, well-rounded view and knowledge of medicine and surgery.

The close association of the medical school and the school of public health of the university has made it possible to give the junior medical student a 96-hour course in public health and hygiene, and an elective 96-hour course in the senior year. With the latter, and three months of field work, he is given a cer-

tificate of public health, and if followed by one year's field work, equivalent to a year's internship in a hospital, he is given a degree of public health. This is creditable pioneer work for this school.

It is regrettable that funds available for the medical school make it imperative to limit the number of students in the schools. We feel that proper State aid should be given the school to provide a teaching personnel and equipment so as to insure the admission of every qualified student from this or any other State.

So closely allied to medical education is nursing education, that we feel obliged to say a word in regard to the acute shortage of nurses in our hospital training schools. In spite of propaganda to the contrary there is a great shortage of graduate nurses for private duty as well as a shortage in pupils admitted to our schools. Members of this Association can help greatly in bringing this profession of nursing to the attention of the eligible girls of the State (those with one year of high school education). We heartily commend the action taken by the medical faculty of the university, recommending that the university take over the teaching of nurses in the various training schools in Louisville. A step in this direction has already been taken in the community, lectures being given by the members of the medical faculty at the college to all the training schools of the city.

W. A. CALVERT,
Chairman.

THE PRESIDENT: What is your pleasure in regard to this report?

THE SECRETARY: In moving the adoption of this report, I would like to call the attention of the members present and profession of the State to the shortage of nurses. It is a matter of the greatest moment. There are needed in Kentucky now a thousand more private duty nurses than there are. There are more than fifty vacancies of public health nurses. If we had them we could pay them a minimum salary of \$1,500.00 a year with transportation furnished. We need fifty public health nurses. No profession offers a greater opportunity for leadership and for definite service than the nursing profession. It seems to me this shortage of nurses is largely due to the fact that the fathers and mothers in the State, and the young girls who are graduating from our high schools do not know anything about it.

The training schools are not filled with nurses. A young woman who is physically able to give service, and who has had one year of high school education, can get her living with her entire expenses paid. In the City Hospital she is given \$18.00 a month for the first two years, and \$30.00 a month in the last year, and at the end of that time, having had ample provision made for her during her school year, she becomes the member of a profession in which she is not only able to earn her living for life, but a greater opportunity is offered her than by almost any other profession. Some of the smaller schools are doing their best work in training nurses. If the members of our profession, as we go from house to house, would talk to the fathers and mothers of young women and talk to the newspaper men and to other avenues of publicity, and bring this matter constructively and thoughtfully before the people, we can accomplish much good. It is very essential that we do this in order to increase the number of nurses. We are being compelled to import into the State many of our leaders in nursing. We have many positions which our own women will not qualify themselves to take. This is shown by the Southern-born leaders in the nursing profession in the North and East. Why are they not in Kentucky? Why, I do not know. They can do the work as well as anybody can do it. Dr. South and Dr. Richardson and Dr. Veech are recognized national leaders in their lines of work, and I believe there are many women who can be similarly trained in doing constructive and preventive work. I want to appeal to you to help us get more nurses in the training schools and get the finest young women physically, mentally and morally that can be found, because no other kind should be inducted into this greatest of professions. We need a lot of them, and for God's sake let us spread propaganda that will get them into the training schools.

W. W. RICHMOND: I wish to second the motion of Dr. McCormack that the report be adopted. Carried.

THE PRESIDENT: We will now listen to reports of delegates by counties.

SIMPSON COUNTY MEDICAL SOCIETY.

W. A. GUTHRIE: It affords me a great deal of pleasure to say that our county society has done better work this year than it has ever done in the past. We have had regular monthly meetings, except three months out of the year.

Things came up so that it was impossible to have meetings at the time.

The first of the year I offered the society a room in the hospital in which to hold the meetings, and they accepted it. The majority of our members attend the meetings regularly. We have two or three men who do not attend regularly. All of the young men attend promptly. Occasionally I give the members a light dinner in the hospital and it works well. Everything in Simpson County is very well indeed. I am sure this year we will do better and more work than we have ever done. We have got more young men than we have had in the past, and they know the necessity of this work and we are coming to the front. I feel greatly encouraged.

FAYETTE COUNTY MEDICAL SOCIETY.

C. C. GARR: The meetings of the Fayette County Medical Society have been well attended. We have had splendid meetings. We have had more present than have attended this House of Delegates of the State society. Our success is largely due to the fact that we have a very efficient president and secretary. It is quite necessary for busy doctors to be jogged up once in a while, especially in regard to the time to read papers. If our secretary meets us on the street he tells us that we are due to read a paper, and he reminds us two or three times about it, and we are never shy of a program. Our programs have been carefully selected, and we select topics that are most timely. I feel very much encouraged by our success in the past year.

MARSHALL COUNTY MEDICAL SOCIETY.

WILLIAM T. LITTLE: During the last fifteen years Marshall County Medical Society has missed very few meetings. We make no attempt to hold a meeting during December, January, February and March, on account of the condition of our roads. During the last few years the interest and attendance in our county society has been greatly increased by meeting with each member at some time during the year. We rotate the place of meeting, so that we meet with each member in different parts of the country.

HARLAN COUNTY MEDICAL SOCIETY.

C. C. HOWARD: The Harlan County Medical Society has an efficient president and secretary, and they have made every effort to have a good line of society

meetings this year. They rotate their meetings from one place to another. We get as many doctors as possible, and we have had some good meetings this year that have been fully up to the standard.

CAMPBELL-KENTON COUNTY MEDICAL SOCIETY.

J. G. FURNISH: I have not a written report. Our meetings have been regular during the year and have been universally fairly well attended. As a delegate this year representing that society, I had no thought of making a detailed report, but what I have said is more in the nature of a general report. I think the conditions are much better now than they have been in the past.

BRECKENRIDGE COUNTY MEDICAL SOCIETY.

E. C. HARNED: We have every doctor in our county in our society and are proud of it. But during the winter we cannot hold any meetings on account of bad roads. Whenever we hold a meeting it is usually an interesting one.

LOGAN COUNTY MEDICAL SOCIETY.

WALTER BYRNE: I came to this meeting with a heavy heart. I was much dissatisfied at the report from the County of Logan. In the phraseology of the newsboy, our meetings have been bum with the exception of one or two. But after getting here and listening to the reports made from other counties, I have been jacked up considerably. We have not fallen off half as much, I think, in our attendance as some of the other societies. When I said our meetings were bum, I referred to the fact that we had only seven meetings in one year. Three or four years ago we had a meeting every month. We have in our county thirty practitioners of medicine, twenty-five of whom are members of our society, leaving five on the outside. In the year 1920 we fell down one member, so that we had twenty-four members. In the year 1921 we had but twenty members, four out of the twenty-four having removed from the county and gone to some other county, so that we still have as full a membership. From September, 1920, to September 1, 1921, we averaged seven meetings a year. Previous to that time, September, 1919, and running on up to 1920, we had ten meetings a year with an average attendance of ten, so you see we are not so far behind.

We have had difficulty in getting our members to read essays, but we have adopted the method suggested by the Councilor from the Tenth District, and

we have our members present case reports and have them discussed. We try to have a social feature. We have not had any feasts, although I think it is a good idea to reach a man's soul through his stomach. I am glad to say that we have not fallen so far behind.

HARDIN COUNTY MEDICAL SOCIETY.

D. E. M'CLURE: There are twenty-three members in our county medical society. This includes every eligible doctor in the county. Of this number only eighteen are practicing in the county.

The society has had regular and well-attended meetings every month in the year except the months in which the Muldraugh Hill meetings are held.

HARRISON COUNTY MEDICAL SOCIETY.

W. B. MOORE: The president and secretary of our society assign men to read papers and report cases. We have a social session occasionally. Those who are to read papers are notified by postal cards because they might forget it. In that way we have a good attendance and the members are not disappointed.

HICKMAN COUNTY MEDICAL SOCIETY.

CHARLES HUNT: We have only sixteen doctors in the county, thirteen of whom are members of the society. We have two practitioners in the county who are not members. One of them was a member years ago but has not been for the past two years. We have monthly meetings with the exception of February and March. We have a small society. We have good papers and excellent discussions. We always have some sort of a program. If we do not have essays, we have reports of cases, and sometimes these case reports are more interesting than the paper. I think we do very well considering the number of members we have. They are all interested. Our meetings are improving. They have been better this year than they were last. However, there is still room for improvement.

THE PRESIDENT: Is there anything else you wish to bring before the House of Delegates at this time in the way of new business or miscellaneous business? We have not heard from the President-elect. Under reports of officers, I have no doubt Dr. Stucky has something to say for the good of the order.

J. A. STUCKY: As President-elect, I have done a great deal of hoping and planning, and I want to promise you that this year I am going to give you the best

that is in me. If we do not have the best year's work in the history of the Association, I shall be very much disappointed. We have had, as you heard, reconstruction work, and I want you to bear in mind that I am simply your servant and yours to command. At any time that I can be of any service, I want you to let me know. This year we must put the Kentucky State Medical Association more prominently on the map of the scientific world than it has ever been before, and I promise you that I will do my best toward that end.

THE PRESIDENT: Is there anything further to be said on matters of interest that may be brought before the House at this time?

THE SECRETARY: I want to suggest that the House of Delegates usually has a session on Monday evening, but the House can adjourn now subject to the call of the President after the general session tomorrow. I understand that Mr. Bryan is going to speak tonight at the municipal tabernacle, and as there are a great many present who would like to hear him, I think it will be worth while for them to have that opportunity.

WALTER BYRNE: I move that we now adjourn subject to the call of the President.

Seconded and carried.

THE PRESIDENT: As this is the last session of the House of Delegates over which I am to preside, I wish to convey to you my sincere thanks and gratitude for your patience and forbearance as well as for the co-operation you have shown to your President during the last year. (Applause.)

The House thereupon adjourned.

SEPTEMBER 21—SECOND MEETING OF THE HOUSE OF DELEGATES.

The House of Delegates met at 5:30 p.m. and was called to order by President Stucky.

THE PRESIDENT: First, I will call for the report of the Council on the matters referred to it.

THE SECRETARY: In the absence of Dr. McChord, the Chairman of the Council, it desires to report to the House that it has considered the following matters referred to it by the House.

1. The Irvine bequest.
2. Indemnification of members unjustly sued for malpractice.
3. District or County Postgraduate Institutes under the auspices of the Council and County.

4. Medical Education.

In regard to the Irvine bequest, the Council recommends that the Association accept the bequest; that the Treasurer, Dr. McClure, take over the custody of the property and that a committee comprised of Dr. R. Julian Estill and Dr. W. B. McClure, of Lexington, and Dr. Murison Dunn, of Richmond, be appointed to draw up a tentative plan for its administration in general accord with the terms of the will as the Irvine-McDowell Hospital for the Aged and Infirm for submission to the Council, and that the Council be authorized to act for the Association in the matter, reporting its proceedings at the next annual session. I move the approval of this section of the report.

Seconded and carried unanimously.

THE SECRETARY: At the Boston meeting of the American Medical Association, the delegation from New York reported their experiences in the indemnification of their members who had been unjustly sued for malpractice, and the Association recommended to State organizations that this plan be unanimously adopted. The insurance in other companies which handle this sort of indemnity have been gradually increasing their prices until it now costs between \$30 and \$100 for a physician or hospital to get indemnity insurance. Every conceivable technicality has been lugged in to prevent the insured physician from receiving active protection.

It seems wise, therefore, for the Association to indemnify those of its members who desire such protection at a minimum fee consistent with safety, and the Council recommends that it be authorized to undertake such policy, fixing the fees and making such rules and regulations as may be found necessary from time to time, reporting its proceedings under this authorization to this House for its approval at the next annual session.

A DELEGATE: I am impressed with a certain amount of danger in this matter. The shyster lawyers who bring these suits would be inclined to be more active if they felt their blackmail was successful as it would be if this Association were behind the doctor in the form of assured indemnity.

THE SECRETARY: I have appeared as a witness in probably 13 malpractice cases, and I have appeared as Secretary of our organization in defense of doctors when they were sued for malpractice, and I have stressed this important

point as much as I could before the jury. Dr. Richmond is one of the best medico-legal witnesses we have, and when a lawyer asks him on cross-examination about a case concerning which he is to testify, he leans over and faces the jury and says we have investigated this matter through our committees and have decided that this is an unjust suit; that this lawyer is trying to get this man's money, and we are defending him and rightly so. If it was a just suit, we would be fighting on the other side. He has won in the Federal and district courts every suit that has been brought against our members.

H. H. RIVERS: Dr. Richmond has adopted the tactics of our old friend, Dr. Coleman, of Paducah. It was Dr. Coleman himself who told me about it, and we all remember him as a most excellent, splendid gentleman. He said on one occasion a lawyer friend noticed how warmly he was taking the part of another physician who was sued for malpractice, and the lawyer took occasion to ask him privately this question, "Dr. Coleman, would you swear to a lie to defend an individual?" He replied, "I would not swear to a lie for any living person, but I am always economical with the truth." (Laughter.)

JOHN W. SCOTT: What is the attitude toward a just suit brought against a doctor? Any of us may conceivably have what a plaintiff might call a just suit brought against us by reason of an error in judgment or possibly through a slip or some carelessness. Most of us might be caught under circumstances in which a suit would go against us, and I should like to be protected against my own mistakes.

THE SECRETARY: You are protected against that sort of mistake. A just suit I believe would be such a one as where a man who had not done an abdominal section before, but performed one that he could not complete, and the patient died without the operation having been completed. He would be in *flagrante delicto*. That is the sort of suit the profession ought not to defend. Such a man should have his certificate revoked. If a man in the ordinary course of his practice is doing something and through some slip or otherwise fails to do it, we should investigate the justness of the case. In regard to the matter of an unjust or just suit, I will say that men like Dr. Moren and Dr. McClure are kind-hearted and sympathetic, and would give a man a square deal, and

things of that sort are covered in the idea of justice in these suits.

J. L. ATKINSON: I rise for information. It would seem from what has been said we are building up two organizations—one for defense and another for indemnity. I take it for granted that not all of the members of the Association will pay this ten dollars. There will be two organizations. When the defense feature was first started it was applicable only to those members who paid the extra dollar and it seems we could not carry that out. I should like to ask if that can be carried out with two separate organizations?

THE SECRETARY: We can carry that out. We found an extra dollar would defend every member in the state. Dr. Moren and Dr. McClure have conducted a defense in favor of our doctors very economically. We find that an additional sum will furnish indemnity for every single member of the Association. I am perfectly satisfied that there might be adopted the same plan that they have in New York State, where they defend their 11,000 members. Up to the time of the formation of this committee there had never been a decision by the Court of Appeals of Kentucky in a malpractice suit that was not against the profession. These decisions have accumulated from time to time. They are standing on the books today against the profession, and the biggest things our attorneys have done have been to secure a series of decisions reversing the old decisions and putting malpractice suits on the basis they should be. As a matter of policy and practice, we find it is much better for us to defend every member. Even through some technicality we can avoid his defense, it is better policy for those who should be protected to defend them all, so that the attorneys can put their pleadings and their papers in the right form. One suit against us by a non-member that goes to the Court of Appeals, with an adverse decision, is a precedent for suits to be brought against other men. In the last two years one man paid \$600.00 for attorney's fees in his own defense, whereas if he had been defended by us his total expenses would probably not have amounted to more than \$250.00, and yet he had to pay the \$600.00 himself. It is in union that we have our strength. It is by the accumulated strength of the entire body that we have our strength in doing all this work, because we divide expenses amongst the entire lot, and it has been, moreover, an

economical way to defend suits brought against our members. I want to say that the entire credit for this economy and good management is due to Dr. Moren. It is a neuro-psychological matter that has been properly put in the hands of the most distinguished member of our profession limited to that branch of our art.

W. B. McCLURE: In the discussion this afternoon I fear that a wrong impression has been created. Reference has been made to the fact that a dollar is being paid by each member for this medical defense work. I do not understand that to be true.

THE SECRETARY: It is not.

W. B. McCLURE: Our treasury is subject to check by Dr. Moren to pay for every medical defense regardless of what it has amounted to. That was changed originally. We had set aside one dollar for the medical defense fund. Now, all of our money is paid in four dollars for the general running of the society. Medical defense is a part of it, and it is subject to check. I do not know whether ordinary property will be liable for damages or not. I think that ought to be provided against.

A DELEGATE: What would be the objection to increasing the dues? Would not the members be willing to pay the extra amount if they knew it carried indemnity? Would they object to raising the dues two dollars? I do not believe they would if they knew about this indemnifying clause. However, it may not be feasible. I do not believe the insurance companies are making too much money.

JOHN G. SOUTH: Regarding the point made by Dr. Scott, that he would not be defended in a so-called just suit, I do not believe the pleadings of the lawyers usually cover that kind of case at all where there has been a slight slip on the part of a physician or a nurse. Their pleadings are drawn to cover gross carelessness and negligence and lack of skill. I believe the lawyers themselves always eliminate these smaller claims in that way in their pleadings.

THE PRESIDENT: Are there any further remarks? If not, what shall we do with this question?

THE SECRETARY: I move the recommendation of the Council be approved.

Seconded and carried.

THE SECRETARY: A third matter that was referred to the Council is con-

tained in the report of the Secretary relative to the work of the organization, in making our membership feel that we are doing something definite for them, in addition to what we are already doing. I think the membership generally is pleased with the work of the organization itself in a way that is not felt in most states, because every member of the Association knows that the publication of our Journal costs more per member than the dues. It does not cost the membership a dollar because our advertisers under Dr. South's administration pay for the Journal and pay some profit each year. That has been due to good management, but our members get a splendid return for the dues they pay. At the present time we are happy to say that there has not been a paper sent to our Journal which has not been published except those that are now awaiting publication. It has not made the slightest difference to the Council whether a paper was a good one or a bad one. The Kentucky Medical Journal does not try to compete with the Journal of the American Medical Association, but we do believe it serves the medical profession of Kentucky well. It certainly does your heart good to look back and see what the Journal was fifteen years ago and then look at it now. Our Journal is now a splendid scientific publication.

In Ohio they have gone a step further. As you may remember, several years ago many of our county societies for a considerable time conducted postgraduate courses. Several members in various parts of the county formed a faculty. You may also remember that Dr. Osler at the Johns Hopkins in Baltimore conducted a course in anatomy for a year. Dr. Will Mayo conducted a course in chemistry, and Dr. Charlie Mayo conducted a course in embryology. The leaders of the profession were doing this work. They themselves felt the importance of it not only because of outside interest, but at the same time this interest would broaden them in the practice of the special branch in which at the time they were serving.

The advance in medical practice has been so rapid, the demand on the busy doctor has been increased with such rapidity, that the profession has felt something additional should be done; that it should do something additional for its members, and the Ohio plan is working apparently quite successfully. They started a year ago with the employment of an organizer to establish postgradu-

ate courses in various centers in Ohio under the supervision of the councilor for a given district, and with the secretary of the county society as local executive to carry on the work of that particular postgraduate course. Men trained in extension work could go to Daviess County, and from the profession of Daviess County organize such members of the faculty as the profession might desire to contribute, then bring in from the outside, at the expense of the Association, such additional demonstrators or lecturers or X-ray machines or other instruments of precision it was desired to bring and demonstrate how they are used, and the results to be obtained by using them. They would talk over the more recent developments in clinical medicine. Dr. Welch, for instance, could go to Ohio and deliver lectures on the clinical diagnosis of cerebrospinal meningitis, give the latest developments in that branch, and demonstrate from the results of his experience secured from interns during the war, that the clinical diagnosis of cerebrospinal meningitis can be made while the disease could yet be cured without deformity long before it can be confirmed by laboratory work, a most important development which Dr. Welch himself designated the rebirth of the practice of medicine. If that sort of thing can be done by the Kentucky State Medical Association, and by our component societies, it seems to me, it would be a valuable contribution, and the Council has recommended to the House of Delegates that we attempt to organize such a course in one or more counties at the beginning and develop them, and in case they are successful and meet with the approval of the profession in the various counties, to continue them or discard the plan if it is found it does not develop or work out satisfactorily. Such a plan might develop the whole profession. We know of the work of Ephraim McDowell, Crawford W. Long, and of other pioneers in medicine. Many of the best things we know have been achieved by country doctors, and many of the teachers in the country, who have had valuable experience, are still there. The idea is to mobilize these men to conduct such postgraduate work in the county themselves, carrying it to the doctor rather than having him go to the medical centers to acquire additional knowledge, such as in pediatrics and other branches of our art.

The Council recommends that it be authorized to incur such expenditure of

money as will enable it to try out this experiment and see whether it will work well in our profession. I move the approval of that recommendation of the Council.

Seconded and carried.

THE PRESIDENT: Is there anything else to come before the House, Mr. Secretary?

THE SECRETARY: The Council recommends to the House of Delegates that a committee consisting of Drs. McChord, Wells and Stucky be authorized to memorialize the American Medical Association, stating to them the present condition of medical practice in the rural districts of this state, and to present the conditions in regard to medical education in this state, the number of medical students, and asking them for constructive relief in some way from that situation.

The idea is that this committee should go into some considerable detail, and at their leisure prepare such material and present it to the Council on Medical Education of the American Medical Association.

For the first time this year a representative country doctor, and at the same time a state health officer, secretary of a state board of medical registration, and himself not a medical teacher, Dr. Welch, of Alabama, was appointed to the Council on Medical Education in the House of Delegates of the American Medical Association by President Work to represent the practitioners rather than a representative of one of the great endowed universities. We want to see such modification brought about as will not lower the standard, but a change in the units both of premedical education and the content of the medical course as will make it practicable to get doctors.

The same thing in another way is just as important in the education of nurses. There should be no lowering of standards in regard to nursing education, but some modification of the content of the nursing course that will make nurses available for sick folks when they need them.

We have three counties in Kentucky in which there is not a single doctor, and there are 10,000 or 15,000 people in each of these counties. We will have 15 or 20 counties in a similar condition unless things change. This condition of things our Legislature will not stand for, and some plan should be devised which will remedy that situation.

J. E. MOSELEY: With reference to

the nursing problem, I move that this matter be referred to the Legislative Committee or to the Committee on Public Policy to petition the Legislature to so amend the law that the nursing problem be placed under the State Board of Health with examiners who would be qualified, progressive nurses, instead of as it is now, placed under a reactionary board of examiners of nurses. I believe further that two years will be sufficient to make a good nurse. We can make good nurses in that length of time. The State Board of Health is asking for public health nurses, and the hospitals and the people of the state need them and private duty nurses as well.

WILLIAM O. EATON: I come from the foothills in Boyd County. We have a county twenty miles long. Outside of the two towns, Catlettsburg and Ashland, there is not a doctor in Boyd County. After the first of October there will be one doctor where there should be eleven. Nobody knows how wide Rowan County is, how long it is, or how high it is. We want doctors even though they do not know how to use a microscope. The folks in the country are going to have babies, and they are going to have broken legs; they are going to have appendicitis, and the kind of doctors we want are those who know how to treat a Colles fracture or Potts fracture. We want men who know how to deal with cases of appendicitis. In country practice you cannot have Dr. Jones examine the blood, Dr. Smith the urine, and another man to use the X-ray. You are thrown on your own resources, and you have to do the best you can under the circumstances and conditions with which you are confronted. Any doctor in the State of Kentucky can say he is a specialist, and nobody can prove he is not. I think we ought to have doctors, and we ought to have doctors that have more education, more training. You cannot train them too much. They should be diagnosticians. Then I think we ought to have specialists, but they should get authority from some one stating they are such. When I came into the State of Kentucky I had to satisfy Dr. McCormack that I had a right to practice medicine, and those men who want to be specialists should satisfy the State Board of Health they have got the right to be such. We have folks in the country fifteen or twenty-five miles from nowhere who deserve medical attention. They have got to raise corn and hogs for us people to eat. There are many counties

possibly in Kentucky that have no recognized high school. How many counties are there that have a recognized high school?

THE SECRETARY: They are striving to establish more and more high schools in the state, but they have not become popular institutions yet.

W. O. EATON: There are a great many counties that have no high schools, and if the country boy wants to obtain a high school education he must go away from home.

THE SECRETARY: To indicate to this body the seriousness of this matter, day before yesterday Dr. Tuley brought to my attention the case of a man, one of the leading doctors of this state, who knows all the rules and regulations and laws and complies with them, who had decided to make a doctor out of his son. When fourteen years of age he sent him to a high school with the exact course laid down by those in authority. He sent him over to Oxford University for a college year, and then brought him down here for a year's study in the University of Louisville in the premedical course. He wants to matriculate. According to the law he must matriculate in a medical school to study medicine and cannot start in a medical school because he failed to get credits from a professor for three hours of French. That is absolutely as absurd and ridiculous as anything I ever heard in my whole lifetime. We tried to secede once down in this section of the country, and we were not successful, but we can secede again medically to establish a reign of common sense. (Applause.)

I am glad Dr. Eaton made the statement he did. I feel every word he said. It is a serious matter. While we are seriously and tremendously interested in the progress of medicine, we do not want impractical standards raised any higher than they are, and I am here to tell you right now that just as soon as the people of this state become aware of the conditions that exist today, unless we arrange for the great mass of our people who live in the country to have the care and attention of physician that we receive when we are sick, there will be something doing. We do not want to go back to that stage that any man can practice medicine that hangs out a shingle, because it was destructive to human life. By exercising our responsibility and our leadership we can do these things. First, the last Legislature passed a law authorizing the State Board of

Health as rapidly as it can to have special branches in medicine organized, and to nominate assistant examiners to the Board, so that a man cannot hold himself out to be a specialist to practice in a limited branch of medicine without his qualifications being tested before a committee representing that branch of the Association, and it will also be gratifying to know that the Council on Medical Association of the American Medical Association has awakened to the fact that they were turning out specialists from medical colleges too rapidly, and they have reversed that entirely, so that hereafter the whole course in medical education will be so shaped as to turn out men as general practitioners. We know that it is impossible to turn out men as specialists at the end of seven years. It cannot be done.

THE PRESIDENT: I desire to quote a conversation I had in Boston and Atlantic City with representatives of three of the leading medical colleges in the United States, each one of whom said to me, "Stucky, for God's sake, let us eliminate from our standardization some of the lesser essentials, so that it will make it possible for us to get hold of big-brained and big-hearted young men and qualify them to practice the science and art of medicine and surgery." This matter is not thought of by us alone. We are feeling it. It is our job. It is coming close to us, and in Philadelphia, Boston, Chicago, New York, Ohio and California I hear of it now.

THE SECRETARY: I would like to ask that the members of the State Board of Health be excused from voting on this motion for obvious reasons.

Motion of Dr. Moseley was seconded, and on being put to vote was carried unanimously.

THE SECRETARY: I move that this House of Delegates approve the formation of the Section on Diseases of the Eye, Ear, Nose and Throat, and its nomination of assistant examiners to the State Board of Health; that other special branches in medicine proceed to perfect their organizations, and recommend assistant Boards of Examiners. We recommend that those who limit their practice exclusively to special branches be given a special license to practice, but only after they have demonstrated they are qualified to do so.

Seconded and unanimously carried.

On motion of John G. South, the House of Delegates adjourned to meet at 8 a.m. Thursday, September 22.

SEPTEMBER 22—THIRD MEETING OF THE
HOUSE OF DELEGATES.

The House of Delegates met at 8 a.m. and was called to order by the President.

The Secretary called the roll, and the President announced a quorum present.

VIRGIL E. SIMPSON: According to my understanding, there are no alternates representing the Jefferson County Medical Society since all the delegates have registered and are technically present at the session being held in Louisville. They are here; therefore I raise the point that our delegates are all present, and no alternates are entitled to serve.

E. L. HENDERSON: There were three alternates appointed, and is it not true that alternates serve for any of the delegates at any time if they are not present at any meeting?

The Secretary read Section 2, Chapter IV. of the By-laws as follows:

"Each component county society shall be entitled to send to the House of Delegates each year one delegate for every 25 members, and one for each major fraction thereof, but each county society holding a charter from this Association, which has made its annual report and paid its assessment provided in this Constitution and By-laws, shall be entitled to one delegate. In case the regularly elected delegate is unable to attend the annual meeting of the Association, the President of the County Society shall have the power to appoint an alternate, who shall have the rights and privileges of a delegate."

V. E. SIMPSON: I ask for a construction of the chair's ruling on the by-law as read.

THE PRESIDENT: The point is well taken.

E. L. HENDERSON: That being the case, there are a great many delegates who register and go home before the end of the meeting. In that case the county society would be unable to have an alternate to represent that county, and that under these circumstances half of the delegates here would be barred for the reason that there have been a great many men in attendance at this meeting who were delegates from their counties and have had to go home and have left alternates to take their places. If it applies to other counties, it applies to Jefferson. The delegates of the Jefferson County Society are here, and the delegates of the other societies or coun-

ties are not here. We have two or three appointed alternates from Jefferson County.

THE PRESIDENT: The chair will rule that the alternate has no right to qualify if the delegate is in attendance at the annual meeting and has registered.

E. L. HENDERSON: I ask for a call of the roll to see who is here in attendance and who has been here.

V. E. SIMPSON: Before that is done I would make the point that there is a big difference between the county where the State Society meeting is being held and all other counties at the time. For instance, we will adjourn from this meeting in thirty minutes and then go into general session. Some of the men who represent Jefferson County as delegates will, in all reasonable probability, attend the session between 10 and 12 o'clock today. The man who went home yesterday morning because of illness of a member of his family or patients is not in attendance this morning, and I think there is a material difference between the interpretation as to whether a man is in attendance in Jefferson County when we are meeting here and the attendance of a man from Bullitt County if he has gone back. It seems to me, that point is not well taken.

J. C. MOSELEY: A delegate from Jefferson County may be called away from the city just as a delegate from McCracken County may be called home, and any ruling that is made should apply to all counties.

THE PRESIDENT: It seems to me the words read by the Secretary should settle the entire matter, and I do not see how an alternate can be appointed to take the place of a delegate when that delegate has registered at the annual meeting.

J. C. MOSELEY: Those people who have been called home will not be represented by alternates.

E. L. HENDERSON: I would like to know who have registered, and I will ask the Secretary to call the roll.

The Secretary called the roll.

W. B. McCLURE: I would like to ask for a ruling on this point: If a Vice-President, who has a vote, is appointed a delegate by his county society, has not that county society a right to representation here through him, and would not he himself have the right to cast two votes?

THE PRESIDENT: The point is well taken.

The next order of business is the election of officers.

Nominations for President-elect are in order.

R. J. ESTILL: I want to present to the House of Delegates this morning the name of a man who for more than thirty years has been a teacher of medicine. He has taught probably a good percentage of the men present this morning; a man who has been active during all that time in various activities of the State Society during its reorganization period. I understand he was first councilor from his district; a man who has been a prolific writer in the different medical journals of our country; a man who offered himself twice in the service of his country, but was rejected for physical disability. Two of his sons served in France. He has been President of the Mississippi Valley Medical Association; he is a member of the American College of Surgeons, a member of the Southern Surgical Association, and a member of urological societies, and has been active in all of these societies. He has three times stepped aside when his name has been proposed in order that men older than himself might be honored with the presidency of this Association, and I believe now in the height of his activity is the time when he can be of most service to us, and I wish to place the name of Dr. Louis Frank, of Louisville, in nomination for the presidency of this Association. (Applause.)

J. C. MOSELEY: I do not want to interfere with the election of a President, but I would like to have this House of Delegates pass on the ruling just made and discuss that portion of the Constitution, and in order to do so, I appeal from the ruling of the chair to the House of Delegates that the counties whose delegates have returned home may have representatives in this meeting.

Motion seconded.

THE PRESIDENT: I will ask Dr. Anderson to take the chair.

THE CHAIRMAN: The question of appeal from the decision of the chair is always in order. The decision of the chair, as I understand it, was made from the letter of the law to the effect that when a delegate has been registered as present at the meeting, and then departs or is not present at a meeting of the House of Delegates, his vote is lost to the society. I believe that was the substance

of the ruling. Shall the decision of the chair be sustained?

OSCAR BLOCK: I would suggest to those entitled to vote that they move up in front, and that all spectators move back of the house.

THE CHAIRMAN: That is a good idea. It will prevent stuffing the ballot box. (Laughter.)

THE SECRETARY: Under the Constitution, members of the Association are always entitled to be present at meetings of the House of Delegates. I am sure the visiting gentlemen will segregate themselves and have the delegates in front of the room. That should be done.

J. F. SOUTH: I would like to inquire of the chair what will decide an appeal from the decision of the chair—what vote? If we are proceeding under Robert's Rules of Order, I think you will find it requires a two-thirds vote.

A standing vote was taken on the question of appeal, with the result that there were 29 votes in favor of sustaining the chair, and 23 opposed.

The Chairman declared the chair sustained in his ruling.

The President then resumed the chair.

JOHN J. MOREN: It gives me great pleasure to place in nomination a doctor who is a member of our county society. He is a very popular man. He is devoted to his profession, and as far as his sincerity of purpose is concerned, there is absolutely no question, and as to his ability you all know of that. He has not only served this community with honor and distinction, but during the great war he cast his lot with the other boys and served with equal honor and distinction. What he has done, he has done well. It gives me great pleasure to nominate Dr. Irvin Abell, of Louisville. (Applause.)

THE PRESIDENT: Are there any other nominations?

V. E. SIMPSON: As a delegate from Jefferson County and representing that portion of the delegation from Jefferson County that receives this matter as I do, I rise to second the nomination of Dr. Louis Frank. It gives me more than a personal pleasure to do this because I feel, if you feel as I do, that we cannot afford as a House of Delegates to close the door of opportunity to men who have worked long and faithfully in the service of the State Medical Association. If you feel that for more than a quarter of a century he has devoted his services to the uplifting of the State Medical As-

sociation and to the profession at large, as well as in its scientific aspects, and whose name is therefore writ large upon the pages of the records of this Association for that period, then vote for Dr. Louis Frank. If you feel that a reward for patriotism is incumbent upon you, then I say that man from whose loins sprang two worthy sons, and upon the altar of his country were they laid for sacrifice, if necessary, and who himself was physically unfit for military duty, is entitled to your consideration from that viewpoint, and I would like you to vote for Dr. Louis Frank. We surely are not less patriotic, nor are we less likely to accord proper motives to those who are patriots in the larger sense than were the Romans of old, and you will recall a noble woman in serving her country desired to be recognized as the mother of the Gracchi.

E. L. HENDERSON: I am not the orator that my friend Dr. Simpson is, but I am a delegate from Jefferson County and am representing a part of that delegation. It is unnecessary for me to speak of Dr. Abell's ability as a surgeon, nor of Dr. Abell as the high-class gentleman that he is. Just three years ago tomorrow I landed in Brest, France, with Dr. Abell, and if you gentlemen had been abroad in the war and you had to leave your wife and children at home, you will appreciate what I am going to say. You will pardon a personal reference. I left my wife and two children at home, but it gave me the greatest of pleasure to go abroad and to serve my country under a high-class gentleman as commanding officer, Dr. Abell. Dr. Abell left a wife and four children at home. Early in the war he offered his services to the Surgeon-General and was a commissioned officer. He organized Base Hospital No. 59, and he served with honor. I simply come before you asking your consideration of Dr. Abell as President, and I wish to second his nomination.

HUGH PRATHER: I hail from the westernmost town and county of the State of Kentucky. It has been my pleasure for more than a score of years to know well and favorably Dr. Irvin Abell, but I now know better and more favorably Colonel Irvin Abell, my former commander. It was on the 16th day of April, 1918, that he, then Major Abell, left Camp Bullet, Texas, as chief of the surgical service, and went to Camp Shelby. I left with him, and we spent four months in Shelby, and all of you who spent the summer of 1918 in the far

south of the Mississippi know the intense heat we suffered. It was during this intensely hot weather that Colonel Abell, having been promoted, subjected himself to the ordeal of a herniotomy that he might be rendered physically fit for duty overseas; and, gentlemen, on the 28th day of August he left Shelby, and on the 21st day of December (I wish to correct Dr. Henderson; it was three years ago) we landed in France under that able and audacious Abell. It seems to me that now the war is over, and that we are back in the country, and that the Abell unit was composed of members of the Kentucky State Medical Association, it is but due him that you elect him President of this Association this morning.

CHARLES G. DAUGHERTY: I wish to second the nomination of Dr. Frank. He is all right. I think it is unfortunate that the name of Dr. Abell has been presented at this time, because personally I would vote for Abell if he were nominated for President of the United States or anything else, but it seems to me this is the time that we should elect Dr. Louis Frank President of the Association. It is recognized that there is a time for every man, and I believe that this is the time when we should seriously consider and vote for a man who has done good scientific work, and we should not inject army politics into this meeting.

J. G. FURNISH: If a personal allusion is pardonable, I want to say that in all the long years I have been a member of this Association, I have never had the pleasure nor the honor to serve in the House of Delegates before, but even in this short service I have never had a duty assigned to me that gives me personally more pleasure than to second the nomination of Dr. Abell. I say it with a feeling of a good deal of pride that I am here as the representative of one of the largest and one of the best societies that is organized in this State, and I could almost challenge contradiction if such was desired. I represent a society composed of over 100 members, and in seconding this nomination I feel confident that I represent the unanimous sentiment of that society.

JOHN G. SOUTH: It seems we have wandered a good way from home. I do not yield in my admiration for the overseas soldier to any man. I think we thoroughly appreciate their services. I also am deeply appreciative of the honor of a man who served his country who was physically unfit, and of a man who sent his sons to the war. But in think-

ing of the history of this Association and abdominal work in Kentucky, I am compelled to think of Louis Frank. Louis Frank has always been a consistent member of this organization since he has been a physician. He has been a constant attendant upon its meetings. He has read and discussed papers; he has taken part in the society from every angle.

I have been connected with the State Board of Health of Kentucky for fourteen years, and it has been the duty of the State Board of Health to look after medical legislation in Kentucky. We have done the best we could at Frankfort. I live at Frankfort, and for that reason have been present more than others, and I want to say that many times we have needed somebody to uphold our hands to protect you from medical quacks and charlatans, patent medicine vendors, and so on, and we have been compelled from time to time to call upon members of the profession out in the State, and I want to say we always found a willing and ready helper in Dr. Louis Frank and an able helper. We have always felt the need of his services in each legislature, and have always gotten it cheerfully.

Dr. Frank is not as young as the other gentleman, and I am a great admirer of Dr. Irvin Abell. Unquestionably, you should honor him with the presidency of this Association, but he can far better afford to wait than Frank. I call attention to the fact that on several previous occasions, as many of you present know, Dr. Frank has gracefully stepped aside for others to be elected President of this Association. I need not call names, but I am sure they are in the minds of many of you present, and it was gracefully done, and I think today is the time to elect Dr. Louis Frank President of this Association.

W. W. RICHMOND: I offered to serve in the world war. I sent my application to Washington to the Surgeon-General and he wrote me I was too young (laughter), but he made me district chairman in order to do what I could for my country.

Dr. Abell is a gentleman and a very able and skillful surgeon. He served in the world war, and I consider that a privilege. Dr. Abell received a great compliment when he entered the world war as a major and was subsequently promoted to colonel. I don't blame him for that, as I would like to have had that honor myself. (Laughter.) Dr. Abell

is patriotic. You are all patriotic and know your duty. Dr. Louis Frank has done, as many of you know, lots of work in this Association. He has read fine papers and has taken great interest in the organization, and if there is a time to honor him, now is the time to do so. Dr. Abell should be made President of this Association at some time. He is worthy of it, and I expect to live to help elect him President. I am only 76 years of age, and I hope to live to help to elect him President. I really do think, however, that Dr. Abell should gracefully step aside this time and let us elect Dr. Frank.

C. G. DAUGHERTY: I move that nominations be closed, and that we proceed to ballot.

Seconded and carried.

THE PRESIDENT: I will appoint as tellers Dr. Vance and Dr. Prather.

There were 60 votes cast, and of this number Dr. Frank received 36 and Dr. Abell 24. Dr. Frank having received the majority of votes cast, was declared duly elected President-elect.

E. L. HENDERSON: I move that Dr. Frank's election be made unanimous by a rising vote.

Seconded and carried.

THE PRESIDENT: Nominations for First Vice President are in order.

W. B. M'CLURE: I move that a committee be appointed to wait on Dr. Frank and notify him of his election, and request his presence before this body.

Seconded and carried.

THE PRESIDENT: I will appoint Drs. M'Clure, South and Henderson to notify Dr. Frank of his election.

Nominations are in order for First Vice President.

C. Z. AUD: I have in mind the name of one who has no public war record. However, he has been married. (Laughter.) I knew he is a gentleman. I know that he will make a good Vice President. I know that he is a good, faithful family physician. I know he has assisted his councilor in every effort his councilor has made in his district. I know that he can preside over public meetings with honor and credit to himself. I know that he has that quality that we desire in a vice president of this Association, and above all things, he has been a faithful country doctor. He can do more to reconcile the disturbing factions of a society than any other man where there has been discord. I could not say more. I wish to nominate for First Vice President,

Dr. Gaddie, of Hodgenville, Larue County.

J. L. ATKINSON: I wish to second the nomination of Dr. Gaddie. You all know him. He is a man who is worthy of the honor, and I hope he will be elected.

C. G. DAUGHERTY: I move that nominations be closed, that the rules be suspended, and the Secretary instructed to cast one vote for Dr. Gaddie.

Seconded and carried.

The Secretary cast one vote and Dr. Gaddie was declared duly elected.

THE PRESIDENT: Nominations for Second Vice President are in order.

THE SECRETARY: I take great pleasure in nominating for Second Vice President Dr. Juanita Jennings, of Harlan County. She has been health officer of Lynch. She stands splendidly with the physicians of the county. They all like her, and she is a splendid woman.

J. N. M'CORMACK: I move that nominations be closed, that the rules be suspended and the Secretary instructed to cast one ballot for Dr. Jennings.

Seconded and carried.

The Secretary cast the ballot as instructed and Dr. Jennings was declared duly elected.

THE PRESIDENT: Nominations are in order for Third Vice President.

W. B. M'CLURE: I nominate Dr. C. W. Rogers, of Rineyville.

HORACE RIVERS: I move that nominations be closed and the Secretary be instructed to cast the ballot for Dr. Rogers as Third Vice President.

Seconded and carried.

The Secretary cast the ballot and Dr. Rogers was declared duly elected.

THE PRESIDENT: The next thing in order is the election of a delegate to the American Medical Association to succeed Dr. Griffith. Nominations are in order.

HUGH PRATHER: I move that Dr. Irvin Abell be elected unanimously as delegate to the American Medical Association to succeed Dr. Griffith.

Seconded and carried.

J. N. M'CORMACK: I move that the Secretary be instructed to cast the ballot for Dr. Abell.

Seconded and carried.

The Secretary cast the ballot as instructed and Dr. Abell was declared duly elected.

THE PRESIDENT: Election of Councilor of the Third District to succeed E. N. Hall.

J. N. M'CORMACK: I nominate John

H. Blackburn, of Bowling Green, and move that the Secretary be instructed to cast the ballot.

Seconded and carried.

The Secretary cast the ballot as instructed and Dr. Blackburn was declared duly elected.

THE PRESIDENT: The election of a Councilor for the Ninth District to succeed Dr. Kincaid.

R. J. ESTILL: I move that Dr. Kincaid be nominated to succeed himself, and that the Secretary be instructed to cast the ballot.

Seconded and carried.

The Secretary cast the ballot as instructed and Dr. Kincaid was declared duly elected.

THE PRESIDENT: Orator in Surgery.

C. A. VANCE: I nominate Dr. J. G. Sherrill, of Louisville, for Orator in Surgery, and move that nominations be closed.

Seconded and carried.

It was moved and seconded that the Secretary cast the ballot for Dr. Sherrill, which he did, and he was declared duly elected.

THE PRESIDENT: Orator in Medicine.

C. G. HOFFMAN: I wish to nominate E. B. Bradley, Lexington, and move that his election be made unanimous. Seconded.

V. E. SIMPSON: I wish to second the nomination of Dr. Bradley.

W. T. LITTLE: I wish to nominate W. J. Sheldon, of Mayfield, for Orator in Medicine.

There were 47 votes cast, and of this number Dr. Bradley received 29 and Dr. Shelton 18. Dr. Bradley was declared elected Orator in Medicine.

THE PRESIDENT: The next place of meeting is now before you for consideration. Invitations are in order.

HORACE RIVERS: I desire to extend an invitation to the Association to meet in Paducah, and I do so on behalf of the McCracken County Medical Society.

J. N. M'CORMACK: I move we accept the invitation to meet in Paducah.

W. W. RICHMOND: I second the motion. (Carried.)

THE PRESIDENT: We will now have the report of the Medico-Legal Committee.

REPORT OF THE MEDICO-LEGAL COMMITTEE.

JOHN J. MOREN: I have no written report to make. So far there is a total of 163 cases reported to the committee, and at present there are only 14 pending. None of these cases are of any serious

import so far as I can find out. There is nothing to worry us unless it be the lawyers' fees. They have raised their prices and it is more expensive to look after these cases than formerly, but so far we have gotten along very nicely. The work is going along as well as any one can expect. I have heard no complaints about the work of the committee, or of any cases that have not been handled properly, and if there are, I would be glad to hear them.

THE PRESIDENT: Report of the Councilor of the Fifth District.

REPORT OF THE COUNCILOR OF THE FIFTH DISTRICT.

C. G. HOFFMAN: The other afternoon, when the Councilors were making their reports, I was called away. My report will be very short. In a meeting of the Council we talked over the situation very thoroughly and agreed that something has to be done for the organization of the counties. There are counties in each district that are not attended by the members. Some of the counties have not had a dozen meetings for two or three years, and the reconstruction period has now passed, and it is time that we get together and formulate some plan to attract men to the meetings either socially or by having clinical features. I know the councilors will be glad to bring any sort of material to read papers before you, to entertain you in any way you will suggest at the time. I desire to get these meetings together. Last year, when I brought the subject up, some of the older men told me we would have to wish ourselves upon these societies, and that has been the case. We write them letters and send them telegrams, and it is very hard to get meetings of any sort. They do not answer our letters. I do not believe there are many, if any, of the secretaries in my district who have ever answered any correspondence, and that is why I shall wish myself on them. We had a delightful meeting at Frankfort. It was well attended, and we had an excellent program. Counties like Owen, Gallatin and Christian are very small, and we have suggested having combined or joint meetings, and to do that I have called upon the Secretary of the State Society to write letters to get them together. We had a delightful meeting, but it was not very well attended. Gallatin County was not organized. They organized at the time and elected officers. If you will get together and organize your societies

your Councilors will come at any time you suggest, bring you material, or anything you want. I think it is high time we got together in some way.

R. J. ESTILL: My experience has been that the counties that have live, wide-awake local secretaries are the counties that are doing the best work. In counties where the Secretary is not particularly interested in the medical profession the society drags and does not do effective work. In the Tenth District I wrote to some of the secretaries and have tried to get such meetings when I could. I do think it is very important to have a live, wide-awake secretary.

THE SECRETARY: Dr. Estill's experience confirms the experience of every man who has had anything to do with county societies. The secretary of the county society is absolutely the center of the organization. As I look over this audience and see the secretaries who are here, I find the county societies that have been successful have had secretaries who have given time and energy and gray matter to the importance of organization. We have had a curious experience in the State. Take Dr. Stine's county, the situation is a different one. Campbell-Kenton has a good society and has had for twenty years, while Henderson County never had a good society longer than three years. Henderson County has in it now some of the biggest doctors in the State. More presidents of the Kentucky State Medical Association have come from this county alone than any other county, and this county has had more members on the State Board of Health than any other county. They have a great profession there, yet some of the men must make the sacrifices that are necessary to make the county society a strong one. If some doctor in every county will devote time and energy to the work of organization it can be done. I am satisfied that if Dr. Moseley took hold of the Henderson County Society and thoroughly organized it he would make a success of it. There is a man in every county society who can do it. This work of organization involves a certain amount of labor and sacrifice. The secretary of the county society is the keystone to the arch, and we do need these men who will work for the organization of these societies and put them on a more successful working basis. It is very essential to do this if we would save the organization and people from medical anarchy. Unless we get busy and do it, it will be done for us, and we will

be on the outside of the organization. We cannot afford to run any risk. The medical situation is in much danger and members of the legislature should be seen and educated in regard to the matter now. We have never had the slightest trouble in the legislature from well-organized counties, but our trouble has come from counties where the members had not respected the profession and themselves. They are bound to respond to the leadership of the profession, and I want to appeal with all the force that is in me for you to organize the county societies, and make whatever sacrifices are necessary to see that they are functioning.

JOHN G. SOUTH: I want to report that the committee appointed to find Dr. Frank, our President-elect, and bring him before this body, found him busily engaged in doing an operation, and he asked us to convey his love and to express his sincere appreciation of the great honor bestowed upon him. We hope to have him present at the general session sometime this morning after he gets through with the operation. He regrets sincerely that he cannot appear before this body now and express his thanks.

J. N. McCORMACK: If miscellaneous business is in order, I wish to move that the salary of our Business Manager (Dr. South) be increased from \$50.00 to \$75.00 a month. She has been overworked, and for years she has been paid an inadequate salary for the services she rendered. Night after night, and even at midnight, she has been busily engaged in correcting proof and arranging for the affairs of the Journal.

W. W. RICHMOND: I move to amend that Dr. South's salary be increased to \$100.00 instead of \$75.00, and I desire to say in making this motion that if there is any member of this organization that deserves a good salary, it is Dr. South. It is a meager salary for the work she does.

W. B. M'CLURE: In seconding the amendment of Dr. Richmond, as Treasurer of the Association, I want to say that I absolutely blush when I send Dr. South each month a check for the sum of \$50.00 for services which she renders to this Association.

The amendment was accepted and the original motion as amended was put to a vote and carried.

VIRGIL E. SIMPSON: I wish to give notice that at the next annual meeting I shall offer an amendment to Chapter

VI of the By-Laws, which pertains to the House of Delegates, amending Section 2, which I think will very materially relieve the present situation which unfortunately was raised in regard to counties not being represented by delegates who were obliged to leave for their homes. I am quite sure that this section can be so amended that it will still conform to the requirements of the American Medical Association and be in accord with our sister State societies' constitutions, and at the same time will not do an injustice in occasional instances that may arise where the presence or absence is so uncertain as that of a doctor or delegate.

THE PRESIDENT: I notice the presence of Dr. C. Z. Aud, Councilor of the Fourth District, and we will now have his report.

REPORT OF COUNCILOR OF FOURTH DISTRICT.

C. Z. AUD: Having been absent during the first session, I feel it is my duty as Councilor of the Fourth District to say to you that the Fourth District is in a fine condition. The doctors are in accord. They are working perhaps better than they ever did, and I am puzzled to know whether it is because I have been sick and could not visit them, or whether it is innate in them. However, the doctors in my district are so well trained that they know what to do.

I would like to call the attention of the Secretary of this Association to the fact that there are counties in my district credited with too many doctors. I have a county that has two more paid-up members than there are doctors in the county, yet we are charged with eight delinquents. I would like to have the books of the State Association gone over and find out those who have died, have quit practicing, or are ineligible for membership on account of their conduct. If there be such their names should be taken off the list. I think this is only fair to the councilor. My district has two counties with a 100 per cent membership, and there is one county with two members more than it has doctors in it.

THE PRESIDENT: If there is no further business to come before the meeting, the House of Delegates will now stand adjourned, and let us all go to the scientific meeting.

The House of Delegates thereupon adjourned sine die.

ARTHUR T. M'CORMACK,
Secretary.

ORIGINAL ARTICLES.

THE SURGICAL TREATMENT OF
CERTAIN TYPES OF
DYSPEPSIA.*

By STUART MCGUIRE, of Richmond, Va.

The invitation to deliver the address on Surgery at the meeting of the State Medical Association of Kentucky is an honor which I fully appreciated and for which I wish to express my sincerest thanks. The task of meeting the demands of the occasion is a difficult one and I have approached it with hesitation. My audience is composed largely of general practitioners, hence I must not be too technical, and on the other hand it contains many surgeons of wide knowledge and experience, hence I must not be too elementary. As the safest way out of my embarrassment I have determined to select a border line subject which I hope will be interesting to internists and suggestive to surgeons, and I will discuss the surgical treatment of certain types of dyspepsia.

A generation ago the physicians held undisputed sway in the treatment of digestive disturbances, and the suggestion that dyspepsia could be cured by surgery, when medical, dietetic and hygienic measures had failed, would have been regarded as an absurdity. Today it is accepted that indigestion when chronic or recurrent is almost invariably caused by organic changes in the stomach, duodenum, gall bladder or appendix, and that relief from symptoms in such cases can only be permanently secured by the surgical correction of the anatomical lesion.

Every one suffers at times from indigestion due to imprudence in eating, but no one has constant, persistent dyspepsia lasting for months or years, unless it be due to some organic disease. A case of indigestion ought not to be subjected to surgery until it has been carefully and properly treated by medical measures without success, but every case that fails to secure relief in a reasonable time should be examined to see if there is not some indication for operative intervention.

In investigating a patient, it should be remembered that while the symptoms may be due to disease of the stomach

itself, they may also be due to reflex irritation from disease of some other abdominal organ which cause pylorospasm. It is a fact that in nine out of ten cases the lesion is not in the stomach but in some associated viscus such as the duodenum, gall bladder or appendix. In other words, while the symptoms are gastric and the treatment surgical, the operation required is not necessarily on the stomach.

Obstruction of the pylorus may be organic, such as results from the cicatricial contraction of an ulcer, or spasmodic, such as results from appendicitis, cholecystitis or duodenal ulcer. The first is mechanical and should be relieved by making a new exit for the stomach contents, the second is functional and should be relieved by diagnosing and correcting the cause which produced it.

At one time it was thought that the operation of gastro-enterostomy was a panacea for all gastric disorders. It was found, however, that while in some cases it accomplished brilliant cures, in others it not only did not relieve, but actually increased the patient's distress.

A gastroenterostomy will cure the symptoms due to an organic obstruction of the pylorus, because it relieves the condition by affording a new exit for the stomach contents. It will not cure but will aggravate the symptoms due to spasmodic obstruction, because it overcomes the protective effort on the part of nature to prevent the passage of irritating gastric contents into the intestinal tract.

It is therefore obvious that the successful surgical treatment of chronic dyspepsia must be based on an accurate diagnosis of the cause and the logical application of measures to correct it. The most frequent extra gastric diseases to be dealt with are appendicitis, cholecystitis and duodenal ulcer. The most common gastric diseases are ulcer and cancer of the stomach.

Appendicitis has been so much discussed that the subject is now tabooed in medical meetings. The disease is so frequent and its diagnosis and treatment important that it is a question whether its exclusion from the program of our societies is altogether wise. It would be a calamity if the dearly earned knowledge which has been acquired with reference to the disease is not handed down to succeeding generations as has been the case with the treatment of fractures. Yet this threatens to be the case.

Chronic appendicitis may exist for years and cause no symptoms except dys-

*Read before the Kentucky State Medical Association, Louisville, September 19, 20, 21, 22, 1921.

pepsia. The patient has no pain or tenderness at McBurney's point, but suffers with acid stomach, eructation of gas and occasional vomiting. The symptoms come on after eating, but there is no regularity, as one meal may cause trouble while another produces no ill-effect. Food never gives relief and exercise usually makes the symptoms worse. After a longer or shorter time there comes an acute attack of appendicitis, with symptoms which make the diagnosis evident. An operation is done to save the patient's life, and six months later the individual comes back to say you have restored his health. The removal of the appendix has cured his symptoms and he is able to eat what he pleases with impunity.

Chronic cholecystitis, with or without gall stones, is another common cause of indigestion. Symptoms during the early stage of the disease are always referred to the stomach. There is usually gastric distress coming or shortly after taking food and relieved by eructation of gas. Frequently there is nausea and vomiting, attended by dull pain in the epigastric region. Later there may be typical attacks of biliary colic. Still later there may come the symptoms of duct obstruction with jaundice, or duct infection with chronic pancreatitis. Jaundice is not present in 50 per cent of cases, and its absence should not prevent a proper diagnosis. An early recognition of cholecystitis is based largely on a careful consideration of the patient's clinical symptoms. The former importance attached to an analysis of the gastric contents after a test meal has been proved unwarranted. Hyper-acidity is frequently lacking, and if present may be due to other causes. The examination of the duodenal contents after the local application of magnesium sulphate by the method of Lyon is still in the experimental stage. The X-ray can only be relied upon to exclude other pathological conditions, as gall stones if present cast no shadow on the photographic plate except in cases where they contain an unusual amount of pigment. Even when the abdomen is opened and the gall bladder is inspected and palpated, it is sometimes difficult to say whether or not it is diseased. It may be of a normal blue color, have thin walls and yet be seriously infected. The accepted operations for cholecystitis are cholecystectomy or drainage and cholecystectomy or removal of the gall bladder. The majority of surgeons prefer cholecystectomy, as

it gives the greatest assurance of permanent relief, but no hard and fast rule can be adopted, as in certain cases the removal of the gall bladder would entail an unjustifiable risk and it had better be drained, even though it seemed probable a second operation will have to be done later.

Ulcer of the duodenum, while formerly thought to be rare, is now known to be a very common disease. Patients give a history of indigestion of many years' standing with intervals of complete relief from symptoms. At first there is a sense of weight, oppression and distention after meals. Later it is noted that discomfort occurs regularly from two to three hours after taking food. Pain comes on gradually and there is a sensation of fullness followed by eructation of gas and bitter fluid. Symptoms are immediately and completely relieved by taking food and patients frequently keep a biscuit or glass of milk easily accessible in order to arrest the hunger pain when it develops. There is usually some tenderness and rigidity in the epigastrium. Later, if stenosis develops, there are the signs of dilated and obstructed stomach. Still later there may be hemorrhage, the blood appearing in either vomitus or feces.

A diagnosis of ulcer of the duodenum can be made with reasonable certainty from the patient's clinical history and it can be confirmed in 95 per cent of cases by an X-ray examination. While it is not to be denied that many cases of duodenal ulcer are cured by medical treatment, and no case ought to be operated on unless heroic measures are tried and failed, still it is a practical fact that the majority of patients in the end have to be operated on.

In suitable cases the best surgical treatment for duodenal ulcers is a pyloroplasty with excision of the ulcer area. This operation has been modified by Finney, Horsley and others so as to make it more effective and applicable to a larger number of cases. Pyloroplasty is an ideal operation, both from an anatomical and physiological standpoint, but it is also ideal in the sense it can rarely be satisfactorily performed. In 72 per cent of cases, according to Deaver, the ulcers are located so far from the pylorus that the method is not applicable, and in cases of long standing the walls of the pylorus are so thick and inelastic that the tissues cannot be approximated in the desired position without producing deformity, and they can-

not be sutured without danger of leakage.

Gastro-enterostomy is the operation which has to be most frequently performed. It consists of an anastomosis between the stomach and a loop of the jejunum, thus establishing a new opening through which the contents of the stomach can reach the intestinal tract. The effect of the operation on the stomach is both mechanical and chemical. Mechanically, it permits the gastric contents to pass readily into the intestines as the new opening between the stomach and jejunum relieves any obstruction that may have existed at the pylorus. Chemically, it lowers the acidity of the gastric contents, as the stoma also permits the alkaline secretions of the liver and pancreas to pass into the stomach. Thus gastric dilation and food stagnation are cured by drainage, and hyperacidity of the stomach is relieved by neutralization of the acid with the patient's own alkali.

How a simple gastro-enterostomy cures a duodenal ulcer is a theoretical question. It is a practical fact that it does cure. Duodenal ulcers do not tend to undergo malignant changes, therefore there is no reason to excise them unless they are causing hemorrhage. If this be the case, and the ulcer is accessible, it is wise to destroy it with a cautery. Balfour noted the fact that a peptic ulcer, which perforated always healed if the patient lived. An analogous condition can be created by burning through the bowel over the center of an ulcer with a pointed cautery and then suturing the opening and protecting the wound with a tag of mesentery or omentum.

The objections offered to the operation of gastro-enterostomy are that sometimes food escapes too quickly from the stomach, causing bowel disturbances; that occasionally bile and pancreatic secretion enter the stomach in large quantities, causing nausea and vomiting, or the so-called vicious circle; and, finally, that in a few cases an ulcer develops in the jejunum at or near the anastomosis, due to the irritation of a mucous surface which has no natural immunity to the action of gastric juices. This complication can be made infrequent by placing the opening at the bottom of the stomach so there will be no retention, and by using catgut instead of silk or linen, so there will be no unabsorbed sutures.

While the operation of gastro-enterostomy requires explanation and apology,

still in properly selected cases it gives good results and will continue to be frequently employed by the best surgeons the world over until some better method is devised. The operation has been much abused by its friends, who in their enthusiasm performed it on unsuitable cases, and by its critics, who offer no satisfactory substitute for it. Say what you please, it has given relief to many patients and will be the stepping stone to future progress.

Ulcers of the stomach occur only one-fourth as frequently as ulcers of the duodenum, and are much more common in men than in women. They are usually in the pyloric end of the stomach, although they may occur in other parts of the organ. They interfere with digestion first by the production of excessive acidity and later by deformity and fixation of the stomach from contractions and adhesions. They frequently cause hemorrhage, resulting in perforation, or undergo malignant degeneration. The usual explanation of the fact that gastric ulcers often terminate in cancer, while duodenal ulcers do not show a malignant tendency, is that the one develops in an acid medium and the other in an alkaline soil. An ulcer of the stomach is a much more serious disease than ulcer of the duodenum and requires to be treated more promptly and radically. Ulcer of the stomach should be regarded as a lesion of potential malignancy and hence must be destroyed by cauterization, excision or resection. This usually so interferes with the motility of the stomach that a gastro-enterostomy is also indicated.

Cancer of the stomach may be a primary disease, but usually develops at the seat of an old ulcer. There is usually the history of indigestion extending over many years. There are first the symptoms of hyperacidity, then the symptoms of gastric ulcer, and finally those of cancer of the stomach. The modern operation of partial gastrectomy for carcinoma of the pyloric end of the stomach originated as a pylorotomy with an anastomosis at the cut end of the duodenum with the upper angle of the gastric incision, it was then changed by Billroth to complete closure of the stomach with a posterior gastro-jejunostomy, and finally it has been perfected by Mayo, who recently introduced the method known as the modified anterior Polya operation. This operation can be done with low mortality in suitable cases and gives admirable results. Patients

with cancer of the stomach have their lives prolonged, and in the 306 cases reported by the Mayo Clinic, over 37 per cent of the patients have remained well at the end of a three-year period. This is a most satisfactory showing for the surgical relief of an otherwise hopeless condition, and even better results may be expected when cases are diagnosed earlier and referred to the surgeon more promptly.

The unsatisfactory results which sometimes follow operations for the cure of dyspepsia may be classed under four heads:

1. Failure of the diagnostician to recognize the true cause of the symptoms: It is a generally accepted truth that successful treatment must be based on a correct diagnosis, and in no line of work does this apply more forcibly than in the surgical cure of dyspepsia. Every possible means should be employed before operation to determine the pathological condition that caused the symptoms, but when the abdomen is opened, a thorough and complete examination should be made of all the various organs. The obvious cause is not always the real cause of indigestion. A provisional diagnosis of gall bladder disease may apparently be confirmed by finding the presence of gall stones, and yet the actual trouble may be really in the appendix. Here the removal of the gall stones will do little good unless the appendix is also taken out.

A more frequent cause of failure is to remove a chronically inflamed appendix and leave other diseased conditions uncorrected. This is especially liable to occur when an appendectomy is done through a small split muscle incision. Except in children and in acute cases of appendicitis in adults, an appendectomy should be done through a mid right rectus incision, which gives sufficient room to completely explore the abdomen and which by extension will permit the correction of any diseased condition found in either the pelvis or upper abdominal region.

2. Failure of the operator to apply the proper technique to meet the indications: The pathological changes found in the abdomen vary so greatly that great wisdom is often necessary to deal with them properly. A standard method to meet different conditions has not been adopted and much is left to the theoretical views or the practical experience of the individual operator. Errors of judgment are frequently made by two

classes of surgeons, and many patients are made worse and not better by unnecessary or illogical abdominal operations. These surgeons are those who are untrained and those who, although experienced, are prejudiced for or against certain procedures. In former days untrained surgeons were barred from work by high mortality. The modern technique, which is easily acquired, has removed this obstacle and they now operate without loss of life, but frequently without relief of the patient's symptoms. Well-known and experienced surgeons are sometimes so biased by their personal views that they do a pyloroplasty when a gastro-enterostomy would be better, or drain a gall bladder which should be removed, or remove a gall bladder which should be drained. All this will be corrected in time. Untrained surgeons will learn by experience or be restricted by law, and prejudiced surgeons, influenced by the part they have taken in evolving certain operations, will be replaced by men with open minds, who will impartially weigh all the evidence and adopt the true and discard the false teachings of the past.

3. Failure of surgery up to the present time to develop a satisfactory operation to correct certain conditions: Surgery of the stomach and associated viscera is comparatively new. Much has been done, but much remains to be accomplished. Only a generation ago the causative relation of appendicitis and other diseases due to dyspepsia was not recognized. Murphy's button was generally employed as the accepted method of forming an anastomosis and the X-ray had not come into use as a diagnostic agent. So, a generation hence, many of the views and methods of today will doubtless be obsolete and will be replaced by theories and practices which will give better results. Many of the operations now employed by the best surgeons will be abandoned and new operations will be devised to correct defects which we already recognize but do not know how to overcome, or to accomplish results which we now desire but do not know how to secure.

4. Failure of the physician to properly direct and supervise the patient's post-hospital treatment: A surgical operation performed on a patient suffering from chronic or recurrent dyspepsia is but the first step in his cure. The operation simply removes the cause of his symptoms and the case must be carefully and judiciously treated for a long time

before he can be said to be well. Frequently the difference between success and failure depends on the post-operative and post-hospital management.

After a partial gastrectomy, the size of the stomach is reduced and food has to be given in smaller quantities and at more frequent intervals than normally. If before operation there is complete achlorhydria, there is no hope that acid production will ever be re-established, and its lack must be supplied artificially by medication.

After a gastro-enterostomy, the stomach empties more rapidly and frequently contains bile and pancreatic fluid which enter through the anastomotic opening. This requires a careful regulation of the diet and occasionally the use of gastric lavage until the stomach acquires a tolerance.

After an operation on the duodenum, gall bladder or appendix, to remove the cause of pylorospasm, the patient must be systematically treated until the hypersensitiveness of the pyloric muscle is relieved and the spasm habit is overcome.

The post-operative treatment of patients is carried out during their convalescence at the hospital under the supervision of the surgeon. The post-hospital treatment is continued after their return home under the direction of their family physicians.

While at the hospital the patient should be impressed with the fact that he is not well because his wound has healed and that it will be necessary for him to be prudent until sufficient time elapses for his organs to accommodate themselves to new conditions and for his weight, strength and nervous equilibrium to be restored. On his return home, he should be directed to place his case in the hands of his family doctor, who should be fully informed as to the nature of the operation that had been done and given suggestions if any special indication existed for treatment. Only by cordial co-operation between surgeon and physician can the best results be secured for these patients.

Typhoid in Infants.—In Bourdillon's case three infants in three different families developed typhoid at an interval of three and four years. The only link between them was the nurse who had cared for them in turn, but she refused examination to ascertain whether the assumption that she was a typhoid carrier was correct.

SOME PHASES OF PYLORIC OBSTRUCTION.*

By JAMES PRITCHETT, Louisville.

In the use of the term, pyloric obstruction, the writer wishes to discuss some points of both spasm and stenosis. Whether such conditions more frequently occur, or are more easily diagnosed, the fact is, that we are seeing more cases both of spasm and stenosis than ever before. It seems most likely, however, that many cases now recognized and positively diagnosed were in the past looked upon as indigestion, marasmus, cyclic vomiting, etc. Especially is this true of pyloro-spasm. As to the cause of the spasm or stenosis, many theories have been advanced.

The fact that the symptoms appear a few weeks after birth and also that the pylorus is formed as early as the fourth month of foetal life, point to a congenital origin. Again, the undue nervousness and excitability of the infant causes spasm of the pylorus, which often is so severe and continuous as to cause a rapid hypertrophy, and in stenosis there is always spasm.

Still, the great Ormand Street Hospital, London, points out some interesting facts relative to the subject. One, that it occurs most frequently in the first children rather than the last. Also that out of forty-two cases, thirty-five were boys; further, when occurring in females it is less severe. The symptoms as to their occurrence and severity are variable. By no means are the classical symptoms always present. A typical clinical history is about as follows: A more or less normal and healthy infant, a few days to a few weeks old, begins to vomit. There is at first nothing characteristic in regard to the vomiting, later it increases in severity, constipation is next noted, which may be extreme, the urinary output is diminished, loss of weight, progressive in character, emaciation, dehydration, peristaltic wave-like movement noted over the abdominal wall. Such is the usual picture. But to go more in detail, we find that the vomiting of pyloro-spasm is not so frequent or severe; in severe types of stenosis the vomiting becomes forcible and projectile, sometimes very large in amount, suggesting that several feedings come up at one time; often so explosive in char-

*Read before the Pediatric Section of the Kentucky State Medical Association, Louisville, September 19, 1921.

acter is the vomiting that it spurts through the nose. The content of the stomach is not much changed. There seems to be little or no pain and usually no great amount of nausea, as the infant is eager for food shortly after vomiting. The earlier the symptoms the more likely the condition is stenosis, also the more grave the outlook.

Constipation is always present, the degree depending upon the amount of food that passes through the pylorus; in some cases it is extreme, the stools being infrequent, small and dark in character, occasionally there is mucus; in such cases the element of stenosis predominates. The abdomen assumes a peculiar shape, the lower part almost flat or scaphoid, the upper, or epigastric, prominent and distended. Loss of weight is a very important symptom, also it is of much aid as to the mode of treatment. The weight loss is often rapid, so that the infant may be much emaciated. In the majority of cases the pylorus appears as a hard tumor in size and shape, somewhat resembling a small olive. The palpation of the tumor is often a difficult matter, as the distension is so great. The stomach can be emptied by catheter and the baby allowed to nurse; by this procedure the tumor is more easily detected. Peristaltic waves in the stomach, visible through the abdominal walls, constitute a very characteristic symptom. They are due to an active contraction of the muscular wall of the stomach, and are best noted during or after feeding; it is not present at all times, often it can be elicited by stimulation or kneading of the epigastrium, then a rounded tumor-like wave often two or even three will be seen running from left to right toward the pylorus. Visible peristalsis so slow and regular in character occurs in no other stomach disorder. Cases have been reported in which the transverse colon was abnormally placed, giving rise to a series of waves resembling somewhat those found in obstruction of the pylorus. When the typical classical symptoms are present the diagnosis is evident. The early recognition is often difficult, especially is this true in those cases in which the main element is spasm, and often they are thought to be difficult feeding cases and one food after another is tried, thinking each disagrees with the baby; likewise the wasting may be thought to be due to marasmus. The fact that an infant whose age is from a few days to a few weeks begins to vomit without any apparent cause, which in-

creases in severity, is forceful, and in which the character of the stomach content is hardly changed is strong evidence of pyloric obstruction. Add to this the constipation, gastric retention, the loss of weight, the pyloric tumor and visible peristaltic wave, and our diagnosis is made. The distinction between the two classes is usually not made with any degree of certainty, since the two are probably always more or less associated.

The use of X-ray is of aid in diagnosis in those cases of doubt, and there are many such. Within the past year, through the courtesy of other physicians and in hospital and private practice, it has been the writer's privilege to have seen several cases. One case occurring in private practice, which two of you remember having seen, as the case attracted no little attention. Various milk modifications were tried to no advantage. Finally thick gruel feeding was resorted to and the child did well and is at present normal and healthy. This case is mentioned for the reason that it has taught the writer that it is a mistake to be constantly changing the character of the food, also the value of thick gruel feeding, which will be mentioned later. The treatment is both medical and surgical. Fortunately we are able by earlier recognition to save many cases by medical treatment. Medical treatment is certainly warranted for a period of one to two weeks, provided the infant has not lost more than 20 per cent of body weight. An accurate daily weight record should be kept, and if it is stationary or a slight gain, certainly our efforts should still be continued along medical lines. Lavage once or twice daily, using warm, normal saline, or a 1 per cent solution of bicarbonate of soda, this procedure tends to relieve vomiting. Watch carefully and note whether it occasions much exhaustion, in which case it should be discontinued.

It seems to the writer that in those cases in which there is but little liquid retention the use of saline intra-peritoneally would be of much benefit, being used once in 24-48 hours in suitable amounts, 50 to 150 cc.

The feeding is very important. It has long been recognized that a food low in fat is desired, as a high fat delays stomach-emptying. If possible, obtain breast milk, which if it be too rich should be expressed and the cream reduced. In those artificially fed, skim milk, peptonized milk, whey and albumen milk are of value. It is especially

important that the formula is not too strong for the child. Usually they stand well a fairly high percentage of carbohydrate and proteid. Each case must be a rule unto itself.

The thick gruel feeding referred to has been very highly advocated, especially in the cases in which spasm predominates. According to Porter, Sauer and others, the thick gruel feedings are of much value. Of course, there are various modifications of gruel feedings; but briefly, they are made up as follows: To skim milk and water, according to the proportion desired by the physician, is added three to five tablespoonsful of either barley, rice or wheat flour, or farina, or cream of wheat. The flour used is made into a cream-like consistency before being added to the milk and water. Carbohydrates in some form, usually Dextri-maltose, is added; the whole mixture is then boiled for one hour or more, stirring almost constantly. Two to four tablespoonful are given at each feeding, the food being placed far back in the mouth. The infant usually takes the food easily. The important fact in this type of feeding is that the stomach tends to retain it.

The question of interval and amount is open for discussion. There are those who use small amounts frequently, every half to one hour; again those who use large amounts at longer intervals, every four or five hours. We can only say, use the amount and interval in each case which proves best for it.

Drugs in the nature of anti-spasmodics are used. Opium in minute doses is recommended, atropin, belladonna and benzyl benzoate. The consensus of opinion is that drugs are of no great aid. The question of operation is always a serious one; certainly one should not be too hasty to advise operation, nor on the other hand wait until the case is hopeless before referring the case to the surgeon. As practical guidance we can say that when there is no improvement within ten days after careful feeding and medical treatment, the case is one for surgery. The mortality is not high when the cases are referred to a surgeon early and especially when there has been no great loss in weight. It is estimated that the surgical risk in infants under seven pounds is much greater than those weighing seven pounds or over, also that the breast-fed child is a much better risk. The mortality also depends upon the type of operation and the skill of the surgeon. The Rammstedt operation

is usually the one of choice, as it is simple, quick and easy of execution. The feeding after the operation is also important. If possible, obtain breast milk if only for a few days; the strength of the formula can rapidly be increased as the infant improves. Some surgeons resort to the use of intra-peritoneal injection of saline some hours before the operation or sodium bicarbonate in solution per rectum. This, of course, is done to combat shock and the prevention of acidosis.

CARE AND FEEDING OF PREMATURE INFANTS.*

By JAMES W. BRUCE, Louisville.

The care and feeding of premature babies present to us some of the most difficult as well as some of the most interesting problems in pediatrics. When a baby is born before its time, both the physician and the parents are apt to entertain a hopeless feeling about it from the start; to think that it is too weak to live, that it never would grow up to be a healthy person, and that it is better off dead, anyhow. For these reasons sometimes these feeble babies do not get all the special care and attention which they demand and without which they cannot make a start in life.

Schwarz and Kahn (1) followed up a series of premature babies for several years and found that although they lagged behind in weight and strength for a year or two, yet by the fourth year most of those who survived did attain normal growth and development for that age. I am sure that every one has had cases of this kind in his practice, where for the first few months life hung by a thread and then the baby "found itself" and went forward and finally caught up with the procession of normal children.

Lewis (2) has made an interesting study of the prognosis of the premature. According to his figures, a 7-months-old baby has a 50-50 chance for life. With babies born before 7 months the mortality is much higher, and practically no 6-months baby ever lives. Babies born after 7 months have better than a 50-50 chance, and the mortality gradually falls as full term approaches. The same author analyzed his figures as to weight and finds that the baby that weighs 3

*Read before the Pediatric Section of the Kentucky State Medical Association, Louisville, September 19, 1921.

pounds at birth has a 50-50 chance, while those that weigh less than 3 pounds have less chance, and those that weigh more have a better chance.

The path of the premature is beset with many perils. In the first place its heat-regulating mechanism is undeveloped and inadequate, so that its body temperature tends to become the same as that of the surrounding medium. If the room is cool the baby's temperature will drop to subnormal and, on the other hand, if it is surrounded by hot water bottles, its temperature will go far above normal. I recently saw a premature baby in my office and its rectal temperature was 94 degrees. I sent it to the hospital and had it wrapped up in blankets and surrounded with hot water bottles and electric lights, and that night its rectal temperature rose to 108 degrees. That baby was still alive two months later. This represented a range of 14 degrees of body temperature in 12 hours' time, and is a good example to illustrate the susceptibility of the premature baby to the temperature of its surrounding medium. This instability of the heat-regulating mechanism must be kept constantly in mind by the attending physician, and the most important and difficult thing to do in these cases is to keep the body temperature at a normal level.

Premature babies are very susceptible to all sorts of digestive and respiratory disturbances, and once infection starts, there is little or no resistance to stop it. Even a dose of castor oil is an ordeal that must be avoided, if it is possible. These babies practically always develop rickets. It seems to be impossible to prevent this, but with careful feeding very little deformity need result.

In the care of the premature baby the one big outstanding feature that we must have constantly before us is the maintenance of the body temperature at the normal level. Various methods have been devised to accomplish this result. The old enclosed incubators have been found unsatisfactory and are now rarely seen. The difficulty here was that the air could not be kept fresh, and also they were difficult to make and have been supplanted by simpler methods. The most ideal method is the specially constructed premature room. The room is large enough to hold several bassinets. The temperature is kept at 80 degrees and fresh air at that temperature is constantly pumped in by a ventilator. Also the humidity is regulated so that the in-

fantants do not suffer from lack of moisture. In institutions where these rooms are installed the mortality among the premature babies is much lower than in institutions where they are not in use. However, an elaborate method of this kind is of little practical value to the practicing physician.

The most practical and satisfactory method of keeping these babies warm is the home-made incubator. It is extremely simple in construction and very efficient in accomplishing results. An ordinary bassinet or basket is used—30 inches long, 16 inches wide and 12 inches deep. A pillow or mattress is laid in the bottom and the side are padded with blanket material to keep out the drafts. The top can be made of simple barrel hoops cut the proper length or of pieces of metal which are bent to fit the basket. I have made these tops out of chicken wire, but they were not very satisfactory. There ought to be a space of 10 or 12 inches between the mattress and the top. The top does not cover the entire bassinet, but leaves a space of several inches uncovered over the baby's face to allow fresh air to come in. From the top is suspended an electric light bulb (ordinary 40 watt) and over the whole frame is put a light blanket. A 40-watt bulb will keep the bed at an even temperature of about 90 degrees and this is as high as it ought to go in most cases. I prefer the electric light bulb as a source of heat. It is very easy to get and to install. It maintains about the proper temperature and it is an even temperature. The electric pad is dangerous, as it develops too much heat. Hot water bottles and stone jugs are troublesome and unsteady and should only be used in places where electricity is not available. More elaborate incubators can be made from aluminum (3) or of asbestos (4). The advantage of these materials is that the apparatus can be quickly set up and is always ready. Also doors of convenient size can be cut so that the lights can be handled more easily. However, there is no particular advantage in these over the simple home-made structure which has been described.

Since the whole purpose of using external heat in these cases is to maintain the baby's body temperature at normal, a careful record must be kept of the body temperature and only so much heat used as is necessary. Usually if the bed temperature is kept at 85 degrees, the baby's temperature will not go subnormal. However, in very small, weak

babies, it may be necessary to keep the bed temperature at 90 degrees or even higher. The room temperature also must be carefully watched and had best be kept between 75 degrees and 80 degrees. It is well to keep the three temperatures in parallel columns, that is, the temperature of the baby, of the bed, and of the room. Only by such minute attention to details can success be attained with these babies.

The baby should be wrapped in a premature jacket. This is best made of a layer of absorbent cotton enclosed between two layers of gauze and should be about 24 inches square and should have a hood of the same material to cover the head. It can be held in place about the baby with safety pins or tapes. It should fit snugly and a good precaution is to stuff a wad of absorbent cotton under the chin and over the chest, as this area is particularly difficult to cover.

The premature baby should not be bathed, as the evaporation of the water will cause a rapid loss of body heat. Instead, it should be anointed with olive oil. This can be kept up as long as necessary, but frequently must be continued for a month.

One most important point in connection with the maintenance of body temperature is to have the incubator ready and warm by the time the baby is born, so that the baby does not become chilled immediately after birth. This is absolutely vital in the care of these babies. In the confusion and excitement that follows the child-birth, the baby is apt to be forgotten until the mother is attended to. This means that the baby is suddenly taken from the uterine temperature of 99 degrees—100 degrees to a room temperature of 72-75 degrees, and I believe that this sudden change of temperature is the most common cause of death, because in a very short time the baby's temperature drops to 93 or 94 degrees. Therefore, when it is known that a baby is going to be born prematurely, it is the duty of the doctor to prepare his incubator and to have it warm so that the baby may be put into it just as it emerges from the birth canal, just taking time to cut and dress the cord and not anointing or cleansing with oil until four or five hours later, when there is no more confusion incident to the birth and when the baby has had some time to adjust itself to extra uterine life.

The feeding of premature babies presents many interesting problems. The best authorities (5) agree that breast-

milk in whole or in part is necessary for their nourishment. Very few premature babies have ever been raised entirely on artificial food. It does not matter whether milk is gotten from several mothers nor does it matter how old their babies are. At the nursery at the City Hospital milk is gotten for the premature babies from any nursing mother who can spare it so long as she has a negative Wasserman.

Feeding should be begun within eight hours after birth. Premature babies require just about twice as many calories to the pound of body weight for growth as do babies born at term. Also they have very little subcutaneous fat to live on. So it is necessary to begin feeding them sooner and to feed them oftener than normal babies. They should be fed every two hours day and night. For the first day or two it is best to give half breast milk and half water, then for a day or two give two-thirds breast milk and one-third water, and by the fifth or sixth day usually whole milk can be given. At first only 2 or 3 drams can be taken at a feeding, but soon one-half an ounce, and by the middle of the second week usually one ounce. The premature baby can rarely nurse and so the breast must be pumped and the milk fed artificially. This can be done easily by means of a medicine dropper or, better, by a Breck feeder, which is nothing but a big medicine dropper. Sometimes the infant does not swallow, but allows the milk to run out the sides of its mouth. In these cases the stomach tube must be resorted to. The stomach tube in these cases is a No. 16 French catheter or smaller and a funnel. I never heard of one being passed into the larynx, and think the danger from this quarter is negligible. It is just about as simple and as easy a task as possible to pass a stomach tube on a new-born baby, and any layman can be taught to do it in a short time.

In case enough breast milk cannot be gotten from the mother or other sources for the baby's maintenance, a complementary feeding of cow's milk must be resorted to. The best preparation that I have seen for this purpose is Dryco Milk Powder—used in the strength of two level teaspoonsful of powder to 1 ounce of water. Eagle brand condensed milk also can be used. If a milk mixture is used, a 7 or 8 in 20 mixture is proper, made up to 6 per cent sugar with some form of dextri-maltose.

Finally, the baby ought to be left in

its bassinet when it is fed and only disturbed once a day when it is oiled. Its temperature can be taken and it can be changed without completely removing the premature jacket and thus subjecting it to change in temperature.

Conclusions.

1. The incubator should be ready and warm when the baby is born so that no time will be lost and the baby will not be chilled.

2. Electric light bulbs give the most uniform and convenient form of heat for the incubator.

3. At least 50 per cent of the food must be breast milk.

4. Let the baby alone, but watch it all the time.

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NOCTURNAL ENURESIS.*

By GAVIN FULTON, Louisville.

Incontinence of urine may be considered as a symptom-complex, rather than as a disease entity. It is of special interest to the pediatricist, not because it endangers life, or except in rare cases even the general welfare of the little patient, but rather because of the mental anguish and distress which it visits upon those of its victims who have reached an age to feel the mortification and discomfort of such a condition. Those of us who have spent much time in study and treatment of children, realize how prevalent is the existence of enuresis and how difficult it is to attain its relief.

The writer has felt surprised at the singular paucity of information to be found upon this subject in the standard text-books. Pfaundler and Schlossman, in their classic system, dismiss the matter with one paragraph of four lines, while the American writers with which I am familiar indulge in two or three pages of generalities on the subject, with the suggestion in the summary to find and remove the cause and to give bella-

donna or strychnine accordingly as to which muscle excites one's suspicion in a given case.

The act of urination is consummated through a series of reflexes in which the bladder, spinal nerves enervating it, and the brain holding an inhibition over the spinal centers play a part. (Chapin and Pisek, 2nd Edition.)

The sphincter vesicae closes the mouth of the bladder by its tonic contraction, and the detrusor urinae, which is usually relaxed or distended, empties the bladder by its contraction. Both sphincter and detrusor are enervated by the segments in the spinal cord corresponding to the third, fourth and fifth sacral nerves. The motor centers of the sphincter keep this muscle in contraction, while the centers of the detrusor hold it in a state of dilation. When the bladder becomes distended with urine, sensory impulses are transmitted by sensory nerves to the sensory centers in the cord which are connected with the motor reflex centers by association fibers. When the motor centers are sufficiently irritated they reverse their action and a negative impulse is sent down to the sphincter by the motor nerves which cause the former to dilate and a positive motor impulse is likewise transmitted to the detrusor, which immediately contracts, and thus we have an illustration of reverse reflex similar to those described by Metzger as taking place in the gall bladder and ducts, and which he calls contrary enervation. This action of contrary enervation, or physiological automatic reflex, as stated by Chapin and Pisek, is held in check by the inhibition of the brain, which holds a restraining influence on the spinal reflexes by nerve fibers which connect with them.

Micturition, therefore, is not a directly voluntary action, but rather an indirect action of the brain which relaxes its hold on the spinal centers, thus permitting the reflex to operate. In infancy the sphincter is weak and the detrusor is thick and powerful, and the bladder and its reflexes very irritable. This action of a strong detrusor against a weak sphincter explains what might be called the physiological incontinence of urine in infants and very young children. But as growth and development takes place, this lack of balance between the opposing muscles disappears and therefore any normal child who has reached an age of understanding should have this function under control.

There are two types of enuresis—ac-

*Read before the Pediatric Section of the Kentucky State Medical Association, Louisville, September 19, 1921.

tive and passive. In the former, when sufficient irritation of the sensory nerves occurs to cause contraction of the detrusor and dilation of the sphincter, through the spinal centers, the urine is expressed from the bladder with a gush. Passive incontinence is the result or paralysis of the sphincter and is generally manifested by a more or less constant dribble.

Incontinence of urine may be organic or functional. The organic type will not be discussed in this paper and the functional type only in its relation to older children who are sufferers from the nocturnal form of this condition.

Many specific causes have been described as etiological factors of functional enuresis, either singly or in combination, such as hyper-acidity of the urine, weakness of sphincter, intestinal parasites, adenoids, and many other things. It so often occurs, however, that either one of these factors are operative as a cause, or else their removal fails to relieve the condition.

Therefore, it is evident that there must be some factor underlying all those discussed above which causes the continuance of the incontinence. My own opinion is in accord with the conclusion of Dr. Joseph I. Grover, of Boston. In a most interesting paper, based upon the study of some two hundred cases observed over a period of seven months in his clinic in the out-patient department of the Children's Hospital of Boston. He says that, regardless of the presence or removal of the above-enumerated causative factors, that there is also an existent neuro muscular fatigue, and the routine treatment as outlined by him is based upon this supposition as a dominant factor.

Dr. Groves further states that this fatigue is not localized to the genito-urinary nerves and muscles, but is general. It is not an acute exhaustion, but is chronic. Thus: When we see children who range in age from eight to twelve years, it is well to investigate their environment and past habits of eating, even so far back as the period of early infancy. Most of the cases I have seen were in children who were bottle-fed.

The great majority of bed-wetters show more or less evidence of malnutrition of the food injury type, such as prominent abdomen with distended colon, flabby musculature, abnormal appetite, and particularly a proneness to a restless activity, with a consequent exhaustion upon retiring. They are un-

willing to go to bed, and equally as hard to arouse in the morning. They sink rapidly into a sodden sleep, which is unrefreshing and insufficient for their needs. In consequence the brain check is gone and the floodgates are open, once perhaps oftener during the night.

The treatment of enuresis should have two objects in view: First, the removal of the underlying cause with its contributing factors, such as adenoids, hyper-acidity, parasites, etc; second, the habit of incontinence, which is the result of the former. Hence the routine treatment should be continued for a long period after the apparent cure of the patient.

Of the many drugs which have been suggested in these cases, strychnine, belladonna and thyroid extract, singly or in combination, are those popularly used, and the value of which is supposed to be enhanced by the restriction to the minimum of fluids after 4 o'clock in the afternoon.

My own experience in the treatment of enuresis by these methods has been most discouraging and not flattering in its results. I have therefore recently attempted some cases along the lines suggested by Dr. Grover, and although the cases are few and the period of observation short, I feel some encouragement. The routine adopted (after Grover) is as follows:

A careful physical examination is made in order to exclude any organic disease and also to discover and remove such secondary factors as might be present. The patient is then put on a wholesome, well-balanced diet, with instructions to have such meals at specified hours three times a day, with positively no lunches or extras between meals. The following would comprise the menu for a day:

Breakfast—Eggs, milk or cocoa slightly sweetened, cooked cereal, bread and butter and orange juice.

Dinner—Roast or broiled meat or fish, one carbo-hydrate vegetable, one green vegetable, buttered bread, stewed fruits, simple cooked desserts and milk.

Supper—They are made to understand that it is simply a holdover until breakfast, and consists of bread and butter and cooked cereal. The object of the very light evening meal is to lessen the burden of digestion and minimize the accumulation of flatus in the large bowel during sleep. Soups, coffee and tea, sweet, salty and highly-seasoned foods are excluded, as are also ice cream, can-

dy, cakes, pastry, jams, bananas and raw apples.

The patient is required to be in bed by 8 p.m., and no active exercise, mental or physical, permitted after 4 o'clock in the afternoon.

He is warned to keep out of close atmospheres, such as picture shows, gymnasiums and other gatherings of children in such enclosures. The importance of regular hours for urination is impressed upon him, and he is instructed to empty his bladder at 8 p.m., immediately before retiring, and is to be awakened for that purpose at 10 p.m., 2 a.m., and 6 a.m. During the day he is encouraged to hold his urine as long as possible in order to train the bladder to a larger capacity and to make the reflexes more tolerant of stimulus. This routine is rather trying to the mother and patient, but the mortification and chagrin experienced by both is such that they very willingly live up to the instructions.

In addition to the above I have noticed a great improvement in the general condition of the patient after the administration of their daily doses after meals of some of the hydrastus compounds either with or without the addition of cascara accordingly as to whether constipation with intestinal atony is present or not.

When the patient has gone sufficiently long without a bed-wetting he is told that the cause of his trouble has been removed, but the habit is still present, though quiescent. Therefore he must not only continue his routine treatment conscientiously, but must exercise his will power in the determination to prevent a recurrence of the act.

In conclusion: First, enuresis of older children is not a neuritis or stigmata of hysteria, but a definite symptom complex of disturbed reflex which is the result of an underlying cause; second, this underlying cause I believe to be a general chronic neuro muscular fatigue; third, and lastly, any treatment which has for its object the successful permanent relief of the condition must be primarily built around appropriate measures for improving muscular tone and increasing general functional activities.

Reaction About Transplanted Tissues.—It is shown by Fleisher that the reactions about the transplanted tissues in immunized heterologous animals are essentially of the same nature as reactions in normal heterologous animals

CEREBRAL EMBOLISM, CASE REPORT*

By FREDERICK G. SPEIDEL, Louisville.

This patient was admitted to the Louisville Public Hospital, April 24, 1921. A provisional diagnosis of neurasthenia was made in the receiving ward.

Mrs. B., is thirty-two years of age, married and lives in a section of the city near the river. The outstanding features of her condition when first seen on the ward were: headache, pain in the left side, temperature between 102 degrees and 103 degrees, pulse 120, respirations 30 per minute and upon attempting to speak, an indistinct, disjointed and apparently irrational flow of words.

Family history: Father died following a paralytic stroke. Mother living and in good health. No brothers or sisters. Has four children all in good health and has had two miscarriages. No family history of tuberculosis, syphilis, malignancy of insanity is obtainable.

Personal history: Patient had measles during childhood and typhoid fever at the age of 15. Last year she had malaria and mumps and has had "rheumatism" for an indefinite period. Menstruation at the age of 15 and has been regular except as related to pregnancies. She uses neither alcohol, drugs nor tobacco and no history of venereal disease was elicited.

Present illness: About November 1, 1920, patient began to have chills and fever on alternate days which was diagnosed malaria. She had mumps at the same time but was not in bed constantly. Since then she has had to go to bed frequently for short periods of time on account of pain in the face and fever.

On April 24, 1921, she discovered that she "could not say what she wished to say," and the physician who was called in sent her to the hospital.

Condition on admission: General inspection revealed a pale, anemic, fairly well developed but poorly nourished white woman about 32 years of age. She was conscious but talking irrationally much of the time. No dyspnoea, cyanosis, edema, glandular enlargements or gross deformities were noted. Facial expression rather blank, pupils react to light and accommodation, the response of the left pupil being rather sluggish. Lips pale, tongue coated, teeth bad, gums and throat negative. Examination of the thorax revealed nothing of note except a faint and transitory systolic murmur over the mitral area and transmitted

*Read before the Louisville Medico-Chirurgical Society.

to the axilla. She has a slight productive cough and has suffered some loss of weight but no night sweats or hemoptysis. An occasional swelling of the hands and feet is attributed to rheumatism. A few red spots are present on the abdomen but there is no tenderness, rigidity, masses or pulsations. The liver is enlarged, extending from the sixth intercostal space to one inch below the costal margin. The spleen is definitely enlarged, palpable and tender. There is some complaint of gaseous eructations and flatus but gastrointestinal tract is otherwise negative. There is no frequency, urgency or pain associated with urination and no vaginal discharge or genital sores.

The pupillary reflex of the left eye is sluggish, the grip of the right hand is weak, the right patellar and tendo-achilles reflexes are diminished and sensation is impaired on the right side. Motor aphasia and agraphia are present but patient can copy and write to dictation. Physical examination otherwise negative.

Diagnosis: In discussing the diagnosis of this case it should be borne in mind that no history was obtainable until several days after the patient was admitted when her husband came to see her and her condition had improved greatly.

The presence of fever, enlarged spleen, some spots on the abdomen and apparent delirium made it imperative to consider the possibility of typhoid fever at once so that proper precautions could be taken. The Widal test and blood culture were negative. The leucocyte count was 9,800 with 73 per cent polymorphonuclear neutrophils and the erythrocytes numbered 3,500,000. No malarial parasites were encountered and in spite of several subsequent prolonged searches none have been demonstrated. A catheterized specimen of urine contained a trace of albumin and a few granular casts. The total nonprotein nitrogen of the blood was 28.8 mg. and the urea nitrogen, 10.0 mg. per 100 c.c., both being within normal limits. The blood Wassermann was negative.

The patient has been in the hospital 20 days. The aphasia and other related symptoms are improved to a great extent but she still has a daily temperature range between 100 degrees and 102 degrees.

The possibility of an aberrant form of encephalitis was considered and as an increased sugar content of the spinal fluid (hyperglycorachia) often characterizes this disease, we made this determination and found 56 mgms. per 100 c.c. or 0.056%. This is a normal figure, practically all cases of encephalitis giving figures between 70 and 110 mgms. per

100 c.c. The blood sugar was also normal, 133 mgms. per 100 c.c.

In support of a diagnosis of cerebral embolism, we have the history of rheumatism and the presence of endocarditis with vegetations on the mitral valve and also the sudden onset of aphasia and the abnormal reflexes and sensation on the right side. Although no malarial parasites have been found in the blood, it should be recalled that there is a definite history of chills and fever on alternate days and it is possible to have an embolism as a complication of malaria due to the tendency of the parasites to agglutinate or to the fact that the larger sexual forms are unable to pass through the capillaries.

DISCUSSION:

John W. Moore: I saw the patient mentioned by Dr. Speidel the second day she was in the hospital. At the time we did not have her history, as she was unable to tell us anything, but the nurse said the night before she had been noisy and kept most of the other patients awake. The chart showed the temperature 102° F., pulse about 85.

At the time of my examination the patient was delirious and unable to talk; she would say a few words now and then but I could not understand them. She has submucous rales scattered throughout her chest; she was coughing and there was some expectoration; she had a much enlarged spleen which was distinctly palpable below the rib margin. I thought the first thing to be done was to exclude typhoid fever. Her skin was dry and scaly, and it looked as though the woman had been sick for a long period, although we were later told the attack developed suddenly. Dr. Moren saw the patient a day or two later and thought it was a case of cerebral embolus of unknown origin. At the same time it was noted the woman had a distinct mitral murmur systolic in type with transmission to the axilla.

Since that time the woman's temperature has remained above the normal range; only occasionally has it been normal; it is usually about 101° F. She is now apparently in a hysterical condition, laughing and crying at intervals. She has gone along for nearly a month without any improvement, she still has an elevation of temperature and motor disturbances, and I think it is not unlikely that she has encephalitis instead of typhoid fever which was my original suggestion.

Sidney J. Meyers: The case reported by Dr. Speidel is interesting. If the temperature elevation continues I would suggest making a blood culture for the streptococcus viridans. It has been my fortune to have seen quite a number of cases. Dr. Baldauf has seen a few of them

with me, in which we had an endocarditis with a mitral lesion and where elevation of temperature continued for quite a while, and in these cases it was found that bad teeth had acted as a focus of infection. Blood culture showed that these patients had streptococcus viridans infection.

Leon K. Baldauf: I am inclined to agree with Dr. Meyers. This looks like a case of endocarditis to me. With the history of rheumatism, with endocardial symptoms developing suddenly, with cerebral disturbance, leucocytosis and septic temperature, it looks to me like a clean cut case of endocarditis.

BASAL METABOLISM, ITS VALUE IN DIAGNOSIS AND TREATMENT, CASES ILLUSTRATING.*

By JOHN WALKER MOORE, Louisville.

In presenting the subject of basal metabolism as it is understood at the present day, it seems wise as an introduction, to outline briefly metabolism in general and the methods for its estimation.

After the products of digestion have been absorbed from the gastro-intestinal tract, various transformations occur in the body. Some of the products are broken down almost immediately into simpler compounds which are eliminated from the body by the excretory organs; some are stored either unchanged or after modification are used later as needed; while still others serve to build up the complex living protoplasm of the tissue. The latter ultimately disintegrate into waste material. This chemical transformation within the body constitutes its metabolism.

The body may be looked upon as a combustion apparatus in which various materials derived from food are hydrolyzed, oxidized, or otherwise altered by means of special ferments until they finally liberate energy which leaves the body mainly in the form of heat. Thus total metabolism in the body may be expressed in terms of energy, and the heat unit, or large calorie, is commonly used for this purpose. (The large calorie is the amount of heat required to raise one kilogram of water to 1 degree C. of temperature.) We can determine the caloric value of carbohydrates, fats, and proteins by allowing a measured quantity of the pure substance to burn in compressed oxygen in a steel bomb placed in a known volume of water.

Measured in such a calorimeter, it has been found that the number of calories liberated

by burning one gram of each of the proximate principals of food are as follows:

Carbohydrates, starch	4.1
Proteins	5.
Fats	9.3

When a gram of sugar or fat is quickly burned in a calorimeter it releases the same amount of energy as when it is slowly oxidized in the animal body. In the case of proteins it is different because oxidation is less complete in the animal body than when burned in a bomb or a calorimeter. So to ascertain the physiological energy value of proteins, we must deduct from its physical heat value the physical heat value of the incompletely oxidized end products of its metabolism.

As early as 1780, Lavoisier taught that animal heat was the result of oxidation and could be compared with the heat produced by oxidation of food substances in the process of burning. He was able to prove that O_2 intake and CO_2 output varied directly with the food consumed. Although his method was crude and somewhat inaccurate, nevertheless his conclusions differ little in the main from our present knowledge of metabolism.

Stimulated by this work and by men such as Pettenkofer, Voit and others, Rubner, in 1894, constructed the first combined apparatus for the estimation of heat production by both the direct and indirect methods. He also proved that the indirect method of measuring heat production was about as accurate as the direct method of measuring heat production. The discovery opened a new field in that total metabolism need not be determined by the expressive time consuming apparatus of direct calorimetry, but simply by measuring either the O_2 consumption or CO_2 liberation of the patient.

Carpenter, of the Carnegie Nutritional Laboratory, has described and compared in great detail the various kinds of respiratory apparatus used in indirect calorimetry. He showed that for indirect determination, two types of apparatus are suitable, the closed circuit and the gasometer.

Of the closed circuit type, the portable unit apparatus of Benedict is considered in clinical work most adaptable. This apparatus is designed to give rapid and at the same time comparatively accurate measurement of O_2 consumption without involving analysis or weighing. In this connection mention should be made of another closed circuit apparatus which has been recently devised by Jones. The advantage of this apparatus is that it is easily portable, weighing not over twenty pounds, and that it is provided with a valve allowing a measured amount of O_2 to be expelled from

*Read before the Jefferson County Medical Society.

a tank into a rubber bag to which the patient is connected. With the use of these methods a litre of oxygen is equivalent to 4,825 calories. This has been accepted as a standard for the reason that Benedict has shown that the respiratory quotient of 86 normal individuals was equivalent to .82; thus a litre of O_2 consumed with a respiratory quotient of .82 is equivalent to 4,825 calories.

Of the gasometer type, the method introduced by Tissot is considered by Boothby to be the one of choice. Briefly, the determinations are made in the following manner—a mask is adjusted over the patient's mouth and nose, and by means of expiratory and inspiratory valves the total volume of patient's expired air is collected in the gasometer for a period of ten minutes. The determinations are made of CO_2 and O_2 content of the expired air, analyses being done in the Haldane gas analysis apparatus. In the hands of Boothby and his corps of assistants this method has proven very acceptable. Nevertheless as has been pointed out by Benedict it requires not only accurate technical skill to employ the Haldane gas apparatus, but it requires also repeated determinations to maintain a high degree of accuracy.

Basal metabolism may be defined as the heat production of an organism at complete muscular rest after a fasting period of fourteen to eighteen hours. When DuBois began his stupendous work in establishing a table of normal basal metabolism rates, he found that these rates varied with age, sex, height and weight. It had been pointed out previously by Rubner that basal heat production varied with the body surface and it is to DuBois that we are indebted for a height-weight formula, simplified by a chart whereby the surface area of a patient can be determined within a few seconds without having to make numerous measurements and time consuming calculations. It might be added that this formula, which is $A = \text{weight} \times 0.425 \times \text{height} \times 0.725 \times 71.84$, is based upon accurate measurements of body surface by means of a thin composition cast, and the error of variation from actual measurements is not more than 1.5%. DuBois standards of normal basal metabolic rates which are used universally by the medical profession represent the number of calories consumed per square meter of body surface per hour for male and female. An increase of 10% above, or a decrease of 10% below the standard figures are to be considered within normal limits.

It would seem wise just here to say a few words concerning the factors that cause variation in basal metabolism.

1. Physiological factors:

A. Those causing increased metabolism.

1. Food. Lusk has shown that a large protein meal may increase the metabolic rate to 46% and an increase is sustained for about twelve hours; with carbohydrates and fat the increase is about twenty per cent and the period of elevation for these substances is shorter than for the ingestion of proteins.

2. Muscular activity. Muscular exercise increase the rate of metabolism, to a greater degree than any other individual factor. Benedict and Carpenter have shown that the metabolism of an individual standing is 17% higher than when the individual is seated. The work of mastication, such as would be involved in chewing gum continuously, may increase the heat production 17%.

B. Factor causing decreased metabolism.

The result of Benedict's experiments on individuals fasting from seven to thirty days showed that there was a decided decrease in the metabolism rate after the sixth or seventh day of the fast.

2. Pathologic and therapeutic factors.

A. Those causing increased metabolism.

1. Diseases of the endocrinal system. Aside from diseases accompanied by fever, and profound inanition, there are no pathological conditions which constantly effect the basal metabolic rate as do disorders of the endocrine system.

In this respect the involvement of the thyroid gland stands foremost. Increase in metabolism is found with great regularity in exophthalmic goitre; in severe cases it reaches a level found in no other condition. DuBois, in classifying the severity of exophthalmic goiter, offers the following comparative metabolic rates as an index: 1. Very severe cases show plus 75% or more; 2. Severe cases show plus 50% or more; 3. Moderately severe and mild cases show plus 50% or less. In the so-called toxic adenomas of the thyroid the basal metabolic rate may slowly attain a high percentage of increase.

Diseases of the ductless glands other than the thyroid show in some cases an increase in metabolism. Especially is this true of the pituitary gland in acromegaly where we are dealing with a hyper-secretion of this gland, particularly of its anterior lobe. Englebach in a recent publication on disorders of the hypophysis has made basal metabolic determinations not only on cases suffering with anterior lobe disturbances, but on disorders of the posterior lobe as well.

The studies made by Englebach show metabolism to be more definitely influenced by the posterior lobe involvement than with simple anterior lobe dyscrasias.

2. Fevers. In general it may be said that in fevers there is an increase of 20% to 30%

above the normal; however, under exceptional conditions it may rise to 60%, possibly even other than fever play a role in the production of increased metabolism, as in some cases, more, as is found in malarial fever. Factors especially in long continued fever with advanced inanition, the metabolism may be lower than normal.

3. Carcinoma. The basal metabolic rate is not increased in mild cases of carcinoma; however, in severe cases of cancer, there is a rise to plus 30%, notably in cases where the nitrogen equilibrium seems unobtainable.

4. Pernicious anemia. In severe cases of this type of anemia, with the hemoglobin around 20%, the metabolic rate is usually increased; the rate, however, is unchanged in mild cases of pernicious anemia, as well as in all types of secondary anemia.

5. Cardiac diseases. Cases with cardiac decompensation, with or without dyspnea, show an increase in basal metabolic rate up to about plus 20%.

6. Lymphatic leukemia. In this disease the metabolic rate may increase to plus 20% or more. Even though the disease improves clinically under X-ray treatment, the metabolic rate remains unchanged.

7. Pulmonary tuberculosis. McCann and Barr (*Arch. Int. Med.* 1920, 26, 663), found the basal metabolism in ten cases of tuberculosis to be normal or slightly above normal in men of the same size. The variations were from minus 3% to plus 15%. It is to be borne in mind that the authors in these cases considered patients with temperature in a basal condition provided the temperature was approximately at the lowest part of the diurnal variation.

8. Drugs. (a) Thyroid extract. Aub reported a case of heart block where the patient was getting 28 gm. of the drug daily for a number of days. When he first saw the patient, his metabolic rate was plus 47%; after withdrawal of the thyroid extract, the basal metabolic rate returned to normal in twelve days. McCaskey reported a case with a metabolic rate of minus 11.3%. The patient was given thyroid extract, 1-4 gr. three times daily; twenty days later, the metabolic rate was plus 20.1%. Later, the patient on his own initiative, took three grain doses of thyroid extract three times a day for some time; the rate following this ingestion was plus 81.3%. Six days after the patient discontinued the drug, the metabolic rate was plus 42.5%.

(b). Caffein. Eight to ten grains of caffeine cause an increase in basal metabolic rate from 7% to 24%.

(c) Adrenalin. Tompkins and co-workers have shown that there is a marked increase in the basal metabolic rate after a hypodermic

injection of 0.5 c.c. of 1-1000 solution of epinephrin amounting to 15% to 20%.

B. Factors causing decreased basal metabolic rate.

1. Endocrinal glands. (a) Thyroid gland. As in diseases with excessive thyroid secretion there is constantly found an increased metabolic rate; the reverse can be said to be true, namely, that in cretinism and myxedema where the thyroid is not functioning, we get a marked decrease in basal metabolism. This decrease may be as low as 40%.

(b) Pituitary gland. Means found diminished metabolism in hypopituitarism with obesity; however, in simple obesity he found the rate to be normal.

Englebaeh, as has been stated, found in hyposecretion of the anterior lobe a marked reduction in basal metabolism in some of the cases, with a slight rise in basal metabolism in others. In hypo-activity of the posterior lobe, there was distinct reduction in the basal metabolic rate.

Of what value is basal metabolic rate in diagnosis and in treatment?

A. Diagnosis.

The basal metabolic rate has proved to be the greatest value in differential diagnosis of neuroses simulating hyperthyroidism. Conditions pointed out by McCaskey such as psycho-neurotic disturbances; circulatory disturbances, as tachycardia or bradycardia, cardiac myasthenias, and certain arrhythmias; fine tremors; hyperhidrosis; loss of weight; and slight temperature disturbances, can be definitely differentiated from hyperthyroidism, from cases with symptoms of psychoneurotic instability and tachycardia which may or may not show thyroid enlargement. These patients are exceedingly puzzling and no physician would dare to express an opinion on symptoms above that the patient is or is not suffering from some thyroid intoxication, particularly if the gland shows some degree of enlargement. It is in this type of case that an accurate metabolic rate is of the utmost value, and we may add that to obtain the actual metabolic rate upon such patients upon the first trial is usually unsuccessful. Their rate, though normal under complete muscular relaxation, may show an increase during the initial test to about plus 15% depending upon the restlessness of the patient. With this slightly increased reading one is fairly safe in judging that the increase is due alone to the muscular activity of a nerve racked individual rather than to the thyrotoxicosis; hyperthyroidism accompanied with tremors, tachycardia, etc., shows a much higher rate,

say 40% or more. In the type of case where a slight increase is associated with restlessness, it is always well to have the patient return for another test; which, for obvious reasons, invariably shows the rate to be within normal limits.

Then, too, in cases of early tuberculosis which show symptoms of vagotonia and sympatheticotonia, a normal rate is of great diagnostic importance.

The metabolic rate is equally important in cases in which there is hypothyroidism. The case may show varying degrees of cessation of thyroid activity; and in the advanced stages of cessation of thyroid activity, the rate falls to the region of 40% below normal. This type of case, however, can usually be diagnosed clinically. The type in which metabolism proves to be of inestimable value is borderline cases, that is to say, cases without diagnostic clinical symptoms, with a definite though not an excessive reduction in basal metabolic rate.

It is often impossible to differentiate simple obesity from obesity with hypopituitarism. Here again basal metabolism offers a helping hand.

It has been justly said by McCaskey that "this procedure has passed the experimental stage and has been assigned its place in diagnostic armamentarium by the side of the X-ray, electrocardiograph, serology, colorimetry, clinical chemistry, etc., to be used as occasion requires."

B. Treatment.

The diagnostic value of basal metabolism in endocrine disorders is no less important than its value in determining the proper method and outline of treatment. In brief, it may be said, in ductless gland disorders the basal metabolic rate determines whether the method of treatment used has been beneficial, or of no value, or even harmful. For instance, in goitre therapy, it serves as no other means at our disposal in indicating the effect of certain lines of treatment. In management of hyperthyroidism whether it be carried out by means of surgery, X-ray, etc. it offers a definite means whereby the thyrotoxicosis can be measured from time to time, thus enabling the physician to direct more intelligently the proper line of treatment.

In hyperthyroid cases, whether it be of a congenital or of a post operative type, our line of thyroid feeding can be accurately determined by ascertaining from time to time the metabolic rate.

The question is often asked, is the metabolic rate a measure to the patient's ability to withstand thyroidectomy? This question should be answered emphatically no. The rate gives

information of the degree of thyroid intoxication, but in no way does it signify that the patient would be able to stand the superimposed stress of operation. We do know, as has been pointed out by Boothby, that the higher the metabolic rate the greater the stress to which the patient is being subjected, and the greater the consequent reduction in his reserve power. He states as a general rule that preliminary ligations are less frequently indicated with patients having rates below plus 50%, and very rarely with patients having rates below plus 40%. We agree with this author that the mortality of thyroidectomy is lower in cases with basal metabolic rates below plus 50%, but we do not feel that we can concur in the statement that preliminary ligation is rarely indicated in cases with rates below plus 40%. If the mortality rate is reduced by preliminary ligation, why not ligate in all cases preliminary to thyroidectomy? It is found not only in our series, but also in almost all other reports, that there is a mortality rate in patients whose basal metabolic rate is below plus 40%.

The basal rate does not tell us the duration of thyroid disorders, nor is it an index to myocardial degeneration. Thus, a patient in a state of remission may have a very slightly increased rate; but as a result of previous thyroid exacerbation, his myocardium might have suffered hypertrophy and degeneration with a marked reduction of reserve force, even to the point of decompensation. It is obvious that in such a case the metabolic rate would not serve as an index for an operative risk. So we conclude that in cases with a rate below plus 40% in which thyroidectomy is contemplated, the decision should not rest upon the basal rate alone, but upon surgical judgment.

We have selected for report a few cases which we hope will show that the basal metabolic rate does not only furnish a more or less decisive factor in diagnosis, but also that it is of no less value as a means of determining the proper, as well as the necessary amount of therapeutic needs or surgical intervention.

Case 1. Neurasthenia: Showing the value of the basal metabolic rate in eliminating hyperthyroidism.

Mrs. C. L. (30503), aged 30, family history negative; Personal history: Married at age of 25, lived with husband four years, then separated. No children. No miscarriages. Previous history: No distress of adult life. Menses irregular, last six to seven days, much pain first day. No urinary symptoms.

Present illness. Chief complain: shortness of breath, dizziness, palpitation, nervousness, indigestion and loss of weight.

Patient states that she has always been nervous and excitable. Has palpitation on exertion and when excited. Perspires and flushes readily. Has spells of dizziness which have no reference to exertion or taking of food. For past three months, has been complaining of pain in abdomen, and is not influenced by taking of food or soda. Does not vomit but often becomes "sick in stomach." Has lost considerable weight in past year, about fifty pounds, even though her appetite has been good.

Physical examination. Patient is markedly emaciated. Face drawn and expressionless. Fine tremors of fingers and tongue. Eyes prominent. Von Graefe suggestive. Widening of palpebral fissures. Unable to converge properly. Pupils are equal and moderately dilated, and react to light and accommodation. Teeth in fair condition. Tongue moist and clean. Neck. Thyroid gland especially the isthmus, is enlarged. It is soft and freely movable. Chest. Lungs negative. Heart normal in outline. No murmurs. Pulse moderately rapid. Pulse ranges between 96 and 106. Abdomen. It is flat. Slight diffuse accentuations. Heart action is regular and tenderness in epigastrium. No masses felt. Pelvic examination. Mucopurulent discharge. Cervix is soft and firm. Fundus somewhat anteflexed. Reflexes normal. No sensory disturbance.

Result of further study as follows: Blood pressure: systolic 100. Diastolic 68. X-ray examination of lungs showed no evidence of tuberculosis. Tuberculin test (5m injected) negative. Gastric analysis, free HCl. 8. Total acidity 22. Urinalysis: negative. Blood examination: Leucocyte count was 8,600. Differential: polys. 70%, lymphocytes 26%, transitionals 4%. Red blood cells 4,180,000. Hb. 80%. Wassermann negative.

Sugar tolerance and utilization tests as follows: 1.75 gms. glucose per kilo body weight given on fasting stomach. One-half hour after ingestion of glucose, blood sugar was 175 mg. per 100 c.c. blood; at end of one hour, blood sugar 175 mg.; at end of two hours, blood sugar 105 mg.

Goetsch's test decidedly positive.

Pilocarpine test suggestive. During the test patient complained of cramping pains in lower abdomen. Defecation occurred during test. Moderate amount of sweating. Basal metabolic rate minus 1.5%.

Comment. This case shows admirably the value of basal metabolic rate in determining whether certain symptoms are due to thyrotoxicosis or not. Before basal metabolic rate was obtained, we were all confident that we were dealing with a case of exophthalmic goitre in that not only were the eye findings,

nervousness, tremors, tachycardia, loss of weight in the absence of tuberculosis findings suggestive, but the positive Goetsch and pilocarpine tests seem to substantiate the diagnosis of thyrotoxicosis. Nevertheless, the metabolic rate was minus 1.5%. It is interesting to note that the sugar tolerance curve was apparently normal.

Case. 2. Psychoneurosis with normal basal metabolic rate: L. C., white, female. Aged 34. Occupation, housework. Entered hospital May 27th, 1920. Chief complaint: Nervousness of life duration. Provisional diagnosis: Goitre.

Family history. One sister had a goitre at age of twenty-one which disappeared after medical treatment. One sister had syphilis and another tuberculosis. Mother has kidney trouble. One brother is insane and in asylum. Entire family of nervous and neurotic temperament.

Past history. Usual diseases of childhood. Rheumatism four years ago. Married twice. One child by first marriage. Menses normal. No abortions. Has been nervous all life, has had "crazy" spells at intervals. Becomes afraid of such things as cigarettes and feels that the smoke will choke her. Does not sleep well. Has used whiskey moderately. Constipation present.

Present history. Has been nervous all life. Vague pains in stomach. Pain in feet. Abdomen swells.

Physical examination revealed a somewhat nervous and neurotic patient. Weight ninety-one and one-half pounds, five and one half feet in height, thin, emaciated, and poor nutrition. Shallow complexion. Left pupil larger than right. Teeth in exceedingly poor condition, pyorrhea alveolaris and decayed roots present. Breath foul. Tongue coated. Temperature 99. Slight enlargement of thyroid gland, especially the left lobe, and patient complains of choking sensation when gland palpated. Eye symptoms negative except for poor convergence. There is a slight, fine tremor of hands. Pulse slightly increased at times to 118 or 120, 84 to 90 at other times. Vaginal examination reveals a lacerated cervix also an erosion. Blood tinged mucus. Uterus movable.

Laboratory findings and subsequent history while in hospital:

Goetsch test slightly suggestive in that pulse rose to 120 from 84. Otherwise negative. Wassermann of blood serum: Negative. Blood pressure: Systolic 118; diastolic 80. Red blood cells: 3,000,000; white blood cells 6,400; polys. 71%; lymphocytes 27 1-3%; basophiles 2-3%; transitionals 1-3%.

Urinalysis: Color, dark amber; appearance,

slightly turbid; reaction, acid; specific gravity 1010; albumin, 4 plus; microscopical: cylinders; large clumps of pus cells, red blood cells, epithelial cells; bacteria. On June 10th, 1920, a basal metabolic rate was estimated which proved to be normal.

Comment. While this case is not so typical of hyperthyroidism as the preceding one, nevertheless the tremors, nervousness, unsteady pulse, enlarged thyroid, and suggestive Goetsch suggest the possibility of thyroid disturbance. The basal metabolic rate, however, was normal.

Case 3. Exophthalmic goitre: The basal metabolic rate in pole ligation. Relationship between pulse and the basal metabolic rate.

T. White, female, aged 21. Medical student in sophomore year, entered hospital October 4, 1920. Chief complaint: Nervousness, loss of weight and palpitation. Provisional diagnosis: Exophthalmic goitre.

Family history. Patient has two sisters with enlarged thyroids and who show symptoms at interval. Family history otherwise negative.

Past history. Has had usual diseases of childhood. Menses normal. Otherwise negative except for slight nervousness.

Present history and physical examination. In February, 1921, patient states that the family physician, while attending another member of the family, noticed her to be nervous and spoke to her about it. According to her statement this is the first time that she had given her condition any thought, for although she talked in a very jerky and rapid manner, she considered herself normal. She had been gaining in weight prior to this time and had dieted to reduce. Her highest weight as known was 134.

Physical examination revealed a young woman very well developed and nourished, having the appearance of one under great strain. Talks rapidly, acts quickly, and flushed readily. Fine tremors of hands and tongue, and eyes showing a distinct protrusion which gives patient a typical staring expression. The Von Graefe, Stellwag, Dalrymple and Moebius' signs are positive. Thyroid gland shows a slight and diffuse enlargement. Moderately soft. Heart action rapid, otherwise normal. Rest of examination negative.

The first metabolic rate was estimated on October 4, 1920. Result plus 25%. The patient was then advised by the family physician to stop school. This seemed to awaken patient to the fact that she really did have a hyperthyroid condition, and after quitting her work, her condition became markedly worse. Her metabolic rate rose, pulse became faster, lost weight, and at times had slight elevation of temperature.

The following illustrates the loss in weight,

the parallelism of the increased pulse rate and metabolic rate and vice versa; also the result of polar ligation which was done as a preliminary step to removal of the gland:

10-4-20. Weight, 114 1-2 pounds; pulse rate 100; metabolic rate plus 25%. 10-30-20. weight 102 1-4 pounds; pulse rate 136; metabolic rate, plus 64%; 11-26-20, Right superior thyroid artery ligated under local; 12-2-20. Weight 98 1-2 pounds; pulse rate, 98; metabolic rate, plus 25%; 12-7-20, Weight, 96 1-2 pounds, pulse rate 108; metabolic rate, plus 33%; 12-8-20, Left superior thyroid artery ligated under local. 12-16-20, Weight 97 pounds; pulse rate, 132; metabolic rate, plus 57%; 12-21-20. Weight 98 1-4 pounds; pulse rate, 128; metabolic rate, plus 47%.

Comment. The determination of the basal metabolic rate in this case gives some helpful clinical data. In the first place, it is worthy to note the striking relationship between the pulse and the basal metabolic rates, and the closeness with which these factors conform. In the second place, it shows the effect of shocking news, in this case disappointment, upon an individual with thyroid intoxication. Many think shocks of different nature are to be considered as an etiological factor in this disease, but it is our opinion, as shown in this case, that shocks simply precipitate the manifestations of an already existing pathological condition. In the third place, the basal metabolic rate serves as an index to thyroid surgery.

Case 4. Exophthalmic goitre: Value of basal metabolic rate when classical symptoms are absent. The effect of polar ligation on basal metabolic rate.

Miss K. Referred by Dr. Herman Humphrey, for basal metabolic rate. Aged 29. Single. White.

Patient first consulted physician August first because of swelling of feet. It was developed during the course of history taking that she was a shoe clerk, at which trade she had been employed for the past eleven years without a holiday. It was also found that recently she had lost some weight, and had frequent attacks of vomiting. Insomnia was also a complaint that had recently developed. Menstrual epoch showed no abnormal variation.

Physical examination showed a well developed, adult female, white, of about thirty years. The fingers and tongue showed no distinctive tremors. Face presented a somewhat drawn and anxious expression. Eyes showed no distinctive signs of exophthalmus. There was probably a slight lack of convergence. Many of the teeth showed areas of decay. Tonsils somewhat enlarged. The thyroid

showed no enlargement on inspection, but to palpation it was thought to be slightly enlarged and soft. This statement, however, was challenged by the surgeon who was called in consultation. The heart showed no abnormality other than rapid action, averaging about 120 to the minute. Aside from slight edema of feet and legs, the remaining examination was negative. Goetseh's test was negative. August 15th, 16 teeth extracted, which was followed by no improvement. October 21st the basal metabolic rate was plus 57%; weight, 129 1-2 pounds; pulse 112. Patient was put to bed. November 21st double ligation of superior thyroid arteries. For the next three weeks patient gained six pounds and improved in every way. However, the pulse continued to average about 120. December 13th, basal metabolic rate plus 44%. Weight, 136 pounds; pulse 116. December 16th partial thyroidectomy. Pathological diagnosis of gland made by Dr. Graves was parenchymatous goitre. December 22nd patient taken home from hospital seemingly much improved, pulse averaging ninety per minute.

Comment. This case is a fair sample in showing the paucity of classical symptoms of hyperthyroidism in the presence of a marked glandular disorder. It is true the pulse rate was high; however, it was thought that there was enough disturbance in the teeth to account for the rise. Since the pulse rate did not improve after the extraction of sixteen diseased teeth, it remained for the result of the basal metabolic rate to assure us that we were really dealing with a case of marked hyperthyroidism, which was later confirmed by the pathological report on the gland. It might be stated in this connection that the surgeon in the case for whose opinion we have the highest respect, was very skeptical about the certainty of diagnosis until the gland was exposed and grossly examined.

It should be noted that the reduction in the basal metabolic rate of thirteen points in the course of about three weeks following ligation of the superior thyroid arteries, is the benefit to be sought by this method of surgical approach. In other words, it reduces the seriousness of thyroidectomy.

Case 5. Hyperthyroidism: Effect of x-ray therapy.

Mrs. R. Referred by Dr. Tuley with following history: Patient has always been of rather nervous temperament, but for past year extremely so. Sleeps very poorly, very little endurance, dyspnea, shortness of breath on exertion. Was examined by Dr. Dowden, who reported a positive Goetseh, and an abnormally high blood curve after the ingestion of a known amount of glucose. As

the result of these tests, together with the clinical findings in the case, Dr. Dowden made a diagnosis, and correctly so, of hyperthyroidism.

August 3rd the basal metabolic rate was plus 24%. At this time patient complained of nervousness, shortness of breath, headache, and insomnia. She was put to bed for one month with but little improvement in her general condition. September 6th the basal metabolic rate was plus 29%. Patient was given seven x-ray treatments, five days apart, by Dr. Bayless. October 19th the basal metabolic rate was plus 11.5%. General condition was markedly improved. No headache, no insomnia and less nervousness. December 2nd, the basal metabolic rate was plus 6%. Patient stated that she is feeling better than she has felt for years.

Comment. The case shows what Aub and Means have pointed out, that x-ray therapy in some cases is a very efficient method of treatment. It shows, in addition, the value of repeated determinations of the basal metabolic rate as an index to the amount of x-ray therapy required.

Two cases of hyperthyroidism in which radium was tried and proved to be of no apparent benefit.

Case 1. Patient N. B., No. 32499. Negro, aged 48, entered hospital July 13, 1920.

Chief complaint. Tachycardia, shortness of breath, nervousness, loss of weight, nausea and vomiting, pain in stomach and sense of constriction about neck. Duration of disease four years.

Physical and laboratory findings revealed a well marked and rather severe case of hyperthyroidism with all the classical signs and symptoms. The Goetseh test was positive as was also the sugar tolerance and utilization test (blood sugar .06% fasting, .136% end of two hours).

July 15th, 1920, basal metabolic rate plus 57%. July 21, 1920, basal metabolic rate plus 57%. Two spikes of radium were inserted through the small mid-line incision into substance of thyroid gland by Dr. Young. One spike into the right lobe, which was enlarged more than the rest of the gland, the other into the isthmus. Radium from right lobe removed at end of twelve hours and from the isthmus at the end of twenty-two hours.

July 27, 1920, basal metabolic rate plus 51%. August 3rd, 1920, basal metabolic rate plus 47%. August 13, 1920, basal metabolic rate plus 65%.

The clinical symptoms improved slightly after the radium in about the same proportion as the metabolic rate was reduced. They later became worse and more aggravated than

upon entrance and began running quite parallel to the increased metabolic rate which followed.

Case 2. Patient S. R. Negress, aged 48. entered hospital July 22, 1920.

Chief complaint: Nervousness, palpitation of heart, shortness of breath upon exertion and loss of weight. Does not know the exact duration of the disease; but states that her right superior thyroid artery was ligated in 1911 as a preliminary step to the removal of the gland, but after convalescence from the ligation she did not return to the hospital for the radical operation.

Physical examination revealed exophthalmos, enlargement of thyroid gland, tachycardiac and other signs and symptoms of exophthalmic goitre.

July 24, 1920, basal metabolic rate plus 50%. August 2, 1920, basal metabolic rate plus 18%. August 7th, 1920, basal metabolic rate plus 21%. August 12, 1920, two spikes of radium inserted as in case No. 1, by Dr. Young. November 17, 1920, basal metabolic rate plus 58%.

Conclusions. In these two cases the symptoms were slightly improved and the metabolic rate slightly reduced for a short period of time after the introduction of radium into the gland—quite similar in comparison to ligation of the superior thyroids. In both cases, however, subsequent rates were higher than at beginning of treatment and these increased rates were supported clinically as indicated by further loss of weight, greater rapidity of heart action, etc., etc.

Case showing a normal metabolic rate three months after thyroidectomy.

Mrs. W. E. S. Referred by Dr. J. M. Morris, September 9th, 1920. Aged 40. White. Home in Florida. Patient first saw Dr. Morris in September and gave the following history.

Past history. Typhoid at age of 10. Malaria when 26. Pleurisy at 30. Married 16 years, two children living and well, oldest 15. One miscarriage.

Present history. Twenty months ago she noticed a dull pain in back of shoulder for which she consulted her physician. She was given medicine with much relief following. Two weeks later began to have repeated fainting spells and became very nervous. Felt as though her nervous mechanism would "blow up" at any moment. At this time she had a subnormal temperature in the a. m., with an afternoon rise to 99. The family physician thought she had lung trouble so sent her to North Carolina. After examination there the doctors told her she had dilation of the abdominal aorta together with a nervous breakdown. She returned to Florida after seven

months' treatment. During her stay in North Carolina she gained sixteen pounds (90 to 106). Her nervous condition much improved. Three months later (January, 1920), patient troubled with nervousness again and palpitation. Pulse rate at this time was 120. She again went to North Carolina (March). She was put to bed and remained there for three months without any marked improvement. Pulse remained about ninety. X-ray of lungs and teeth showed the lungs to be negative, while one tooth showed a root abscess. In September, 1920, she came to Louisville. At this time her weight was ninety-two pounds and her pulse 134. There were fine tremors of fingers and tongue. Eye balls were suggestively prominent. None of the eye signs of exophthalmic goitre were distinctly positive. The thyroid gland showed only a moderate diffuse enlargement but by no means pronounced.

On September 9th, 1920, the basal metabolic rate was plus 48%. pulse 134. Weight ninety-two pounds.

On October 6th, 1920, patient was operated upon by Drs. Louis and Wallace Frank.

On December 31, 1920, the basal metabolic rate was normal. Pulse ninety. Weight ninety-seven pounds. Patient's general condition markedly improved. Does not suffer from palpitation. Appetite is good and gaining in strength daily. No tremors of fingers or tongue.

Comment. It is evident from the history that the patient had been under close observation for about sixteen months and it was not until recently that the trouble was diagnosed as hyperthyroidism and diagnosis confirmed by the metabolic rate. The rate three months after thyroidectomy was within normal limits. Even though the patient has some tachycardia weakness and nervousness, we can assure her that these manifestations are no longer due to the remaining thyroid gland, *per se*, but are the result of the hyperthyroidism which existed previous to the operation. Judging from the present rate it would seem as though the surgeons have removed a sufficient quantity of the gland.

In closing we wish to thank the physicians mentioned in the foregoing case reports for the data they have most generously supplied and for the privilege of reporting the cases.

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EXTRA-GENITAL CHANCRE—CASE REPORTS.*

By WILLIAM J. YOUNG, Louisville

According to recent works on syphilis, the frequency with which extra-genital chancres are found varies from five to ten per cent. The facts that the initial lesion of syphilis may resolve with or without treatment; likewise that it may or may not be followed by an eruption of varying intensity and duration which may disappear irrespective of treatment, make it reasonable to infer that the percentage is somewhat greater than stated.

I am presenting in this connection some pictures of extragenital chancres recently seen by me, not with the idea of offering anything especially new, but to refresh our memory as to their frequency. The most likely reason for the delay in diagnosis of extra-genital chancre is because its probability does not occur to the physician. Oftentimes when the matter is suggested to the attending physician, he will at once concur in the clinical diagnosis. For this reason, also, I believe it to be a good idea to show the pictures as a reminder.

About the only feature of interest in the two cases reported is that both girls were "keeping company" with a young man whose voice was husky and who complained of sore throat. *Spirochæta pallida* were found in both the cases.

Case One. Chancre of upper lip: Girl, white, single, aged twenty-one years, was referred for diagnosis to Dr. I. N. Bloom's clinic at the Louisville City Hospital. Situation: Lesion on upper lip, occupying inner two-thirds of right side. Duration five weeks. Clinical appearance of lesion; Ulcer measuring one-fourth inch across and one-half inch long,

with an indurated base, convex surface covered with a film-like scab which upon removal was followed by bleeding. No glandular enlargement on palpation. Faint secondary eruption over body and a few scattered maculo-papular lesions over face. Venereal history negative. *Spirochæta pallida* found. Wassermann reaction ++++.

Case Two. Chancre of Tongue: Girl, white, single, aged nineteen years, presented for diagnosis in Dr. I. N. Bloom's clinic at the Louisville City Hospital. Situation: Lesion on tongue, right side, lateral portion just back of tip. Size of lesion: Five cent piece. Duration: Three weeks. Clinical appearance of lesion: Chronic ulcer with indurated base circumscribed and with a slightly concave surface covered with gray false membrane. Pa-



tient complains of practically no pain except on taking acids. Temperature 101 degrees F.; has aching joints and general feeling of lassitude, characteristic of incubation of the second period. No eruption present. Enlargement of anterior cervical glands and both epitrochlears. *Spirochæta pallida* found. Wassermann reaction ++++.

Both of these patients after examination were given arsphenamin intravenously, enough blood for Wassermann test being allowed to flow from needle into test tube before the drug was administered. As the Wassermann report in each case was returned ++++ the routine treatment for generalized syphilis was given.

The importance of early diagnosis by demonstrating the *spirochæta pallida* before the Wassermann reaction becomes positive cannot be too strongly urged, as the so-called abortive treatment of six arsphenamin administrations in seven days has proven very efficient in my hands as it has with others. Personally I dislike the term "abortive" when used in this sense, as we have no means of

*Clinical report with exhibition of photographs before the Louisville Medico-Chirurgical Society. March 11, 1921.

proving the disease aborted, and it is my practice to continue antisyphilitic treatment over a period of time with mercury and subsequent arsphenamin as in demonstrated generalized syphilis.

In the use of the abortive treatment by intravenous arsphenamin injections daily for three days, followed by a day of rest and repeating the daily doses for three more days. I have been fortunate in having no untoward symptoms other than a high specific gravity of the urine toward the end of treatment.



DISCUSSION:

J. G. Sherrill: The most interesting feature in Dr. Young's report is that both his patients were infected from the same source. Extragenital chancres are probably more common than we have hitherto believed. I have seen quite a number of cases of that kind. In some instances, as Dr. Young has said, the diagnosis is delayed because the character of the lesion is not suspected by the attending physician.

In my opinion Dr. Young is wise in not depending upon the so-called abortive treatment in cases such as he has described. The blood Wassermann being +++ indicates generalized syphilis, and the patient should be treated accordingly. As soon as the diagnosis of syphilis is made vigorous anti-syphilitic treatment should be instituted and continued for a sufficient time to produce a clinical cure if possible.

I believe the time is coming when the pendulum of therapeutic thought will swing toward the use of mercury in the treatment of syphilis, regardless of the stage of the disease when the patient first comes under observation, supplemented by proper dosage of arsphenamin.

S. G. Dabney: I believe extragenital chancres are far more common than we have ever thought.

One of our colleagues, now deceased, stated prior to his death that he thought more syphilis was contracted innocently than in the usual way. Whether that is true or otherwise I am not prepared to say.

My experience has been rather limited. I have seen one chancre of the lower lip, two or three of the lips, and three of the tonsils. The chancre of the lower lid was in a woman in the thirties and looked very much like an unusual form of chalazion; it was situated just at the outer corner of the lower lid. However, it did not follow the course that chalazion usually does. I tried to remove it with a curette but found this impossible. The lymph gland in front of the ear became enlarged, and after keeping the patient under observation for a week or two I became convinced it was a chancre. I then sent her to a syphilographer who was perfectly certain as to the nature of the lesion. I understand the woman was greatly improved by the administration of arsphenamin.

Two of the cases in which a chancre appeared inside the month are of some interest. In one of these, a young man contracted the disease by smoking a pipe which had been used by another man. I told him he had a sore in his mouth which I was confident was a chancre. He "threw up his hands" and said that his room-mate had syphilis and that he had been smoking his pipe. I think that was the probable means of transmission in that case. The other was a case that I have mentioned before, the only one I have ever seen where it seemed that a chancre of the mouth was transmitted by sexual perversion.

I saw one chancre of the tonsil, the patient being a young woman, and I have every reason to believe that the disease was contracted from her sweetheart to whom she was engaged. The family physician told me this young man had active syphilis at that time. In the other cases I could not trace the mode of infection. One was in a trained nurse who probably infected herself while handling a syphilitic patient.

Wm. J. Young, (closing): There are no statistics showing the actual percentage of extragenital chancres, but the general impression is that it will not exceed ten per cent. Of course we know cases are found in every locality where syphilis is innocently acquired. These are the cases which are usually overlooked by the attending physician and the diagnosis is not made promptly.

My object in showing the pictures and briefly reporting two illustrative cases was to remind you to be on the lookout for extragenital chancre. This is particularly important to the general practitioner who is usually the first to see these patients. The possibility of syphilis must always be remembered, because it may be acquired in many innocent ways.

PERFORATION OF UTERUS BY CUR- ETTE; (CONTINUED REPORT).*

By L. WALLACE FRANK, Louisville

I desire to make a continued and final report and again exhibit the patient shown before this society April 18th, 1921. For the information of those who were not present when the original report was made, the following abstract is given: The patient is thirty-two years of age and was admitted to the Louisville City Hospital, April 15th, 1921. She stated that on April 9th, "the bag of waters broke;" she was then thought to be about four months pregnant; this was the first knowledge she had of anything wrong. She soon developed chills which continued until her doctor gave her some medicine. She was able to be out of bed the following morning, but was compelled to return to bed about noon because of severity of the chills. April 11th a curettment was performed and on the 12th and 15th the uterus was irrigated. She suffered severe pain after the last irrigation and another doctor was called who sent her to the hospital.

On admission, based on the foregoing history, a miscarriage with retained infected secundines was suspected. She complained of no abdominal pain; there was no muscular rigidity; temperature 97 3-5 degrees F.; pulse 120; there was slight distension; no masses palpable. She was given a vaginal douche shortly after admission.

The day after admission I examined the patient and found marked abdominal distension, and a mass presented in the vagina which looked like sloughing membrane. She was taken to the dressing room and an attempt made to remove what was supposed to be some of the membrane which had not been fully extruded. All that could be seen was a grayish sloughing mass. After pulling on this once or twice she complained of intense abdominal pain. Further examination disclosed the fact that we were pulling on a section of the large intestine; from the striae present we knew it was the colon, but exactly what part we could not determine.

There was a perforation in the colon the size of a silver dollar; this sloughing mass had been in the vagina for five days; it was about six inches in length and had protruded into the vagina through the cervix.

The patient was then taken to the operating room and a four-inch mid-line incision made into the abdomen. The small intestine was found enormously distended and obstruction

was evidently complete. The pelvis contained considerable inflammatory exudate especially about the uterus, and in the left broad ligament was a perforation through which the sigmoid had protruded into the upper part of the cervix, then into the vagina. By this time the patient was in serious condition; she was almost pulseless and gasping; during the anesthesia a drop of ammonia was given every two minutes. We quickly closed the mid-line incision and made a stab opening in the left flank through which we brought the upper part of the sigmoid; this was opened and a tube introduced which was sutured in place. No further surgery seemed justifiable at that time. So much for the past history.

The next morning when I visited the hospital the interne was asked at what hour the patient had died. He replied that she was still living and apparently doing very well. Feces had been voided through the sigmoid opening and continued to do so for six weeks. In the meantime her pulse became normal and she improved in every way. Of course she still had the protruding mass of sigmoid in the vagina.

Subsequent operation: The patient having continued to improve, on May 28th the abdomen was opened about an inch to the left of the original incision; the sigmoid was drawn upward into the cavity and about four inches resected, going well into healthy structure on both sides, and an end-to-end anastomosis made; the perforation in the lower uterine segment was carefully sutured and the abdomen closed with tube drainage. The tube was removed two days later and in the meantime feces passed through the sigmoidostomy. About eight days after the operation the sigmoidostomy opening closed spontaneously; the abdominal wound closed promptly; and the patient is now ready to go home. Cases of this kind are so unusual that I thought it would be interesting to exhibit the patient again before dismissing her from the hospital. None of the wounds in this case became infected and the patient's recovery is complete.

I might add that it was a problem just what steps to take when this patient was first examined and the true state of affairs ascertained. I believe I did the only thing that was justifiable in the original operation. The sigmoid had then been in the vagina for five or six days, and it would have been impossible in my opinion to have replaced it in the cavity and made the necessary resection without having the patient die on the operating table. The most sensible procedure, it seems to me, was to relieve the obstruction as quickly as possible and get the patient off the table alive.

*Clinical report before the Jefferson County Medical Society.

At the subsequent operation the woman was in fairly good physical condition and resection was performed without any difficulty.

Cases of this type are entirely different from those where uterine perforation is recognized immediately following curettment, and the method of management must be varied accordingly.

DISCUSSION:

Simrall Anderson: It is a well known fact that uterine puncture, for instance by a curette, really does no harm unless infection exists. I had the misfortune on one occasion to see a patient who had been curetted and whose uterus had been punctured, and advised immediate abdominal section. After the abdomen had been opened the resulting trauma was found so slight that I really regretted having advised the operation. The only point I desire to make is that perforation of the uterus with a curette or sound does not of itself justify abdominal section; the condition is not as serious as ordinarily considered and does not as a rule require operative treatment.

Frank T. Fort: Dr. Frank is to be congratulated on the outcome in this case. I recall having seen a somewhat similar case in the city hospital several years ago. A colored woman was admitted at night, and the intern thought she had an incomplete abortion and curetted the uterus. The next morning symptoms of peritonitis had developed, and when we opened the abdomen a mummified fetus was found floating in the cavity. The history in this case was perfectly clear so far as could be ascertained, the woman stating that she had passed the fetus. Someone had attempted a curettage and had punctured the uterus. At the time of our exploration the uterine perforation had closed; the uterus had contracted to normal size; the woman had general peritonitis; and, as already stated, a four months fetus was found floating among the intestines.

C. G. Forsee: The most important item in the case reported was the wisdom Dr. Frank used in taking care of the patient. Surgeons as a rule are in a hurry to get their patients well and get them off their hands, so to speak, and insist upon something being done immediately. This is sometimes a serious mistake. The chief source of congratulation, outside of the unusual character of this case, is the judgment used in the primary operation.

H. N. Leavell: I desire to commend Dr. Frank's method of treating this patient; he certainly showed wonderful judgment primarily in not attempting to do much surgery. A feature that has always impressed me is the amount of traumatism which may be inflicted upon the uterus with impunity. It would seem that an injury of sufficient extent to permit extrusion of the in-

testine through the uterus would be of such moment as to cause considerably more shock than is usually apparent in these cases. I presume Dr. Frank's patient had some peritonitis when she was admitted to the hospital. The subsequent management in a case of this kind requires just as much skill as the primary treatment in closing the wound so grossly inflicted upon the uterus.

I fail to see how the uterus can be perforated with impunity at any time, that is without the production of real damage as evidenced by shock or subsequent peritoneal involvement. I cannot quite agree with Dr. Anderson in this respect. I have seen two or three cases of ruptured uterus, one in particular I recall which was perforated during curettment, and in these cases there was primarily a great deal of shock, almost as much as would occur from rupture of the gall bladder or a perforating gastric ulcer.

The outcome in the case reported emphasizes the wonderful surgical judgment exhibited by Dr. Frank, and I am glad to hear his final report.

John R. Wathen: We have all enjoyed Dr. Frank's excellent report and he is to be commended on the method which he employed. One rather important point to be considered in the handling of such cases is, whether we are dealing with clean or septic cases. If septic material is introduced and the uterus is perforated that is one proposition. If the uterus is ruptured during labor, or is perforated in some way without the introduction of septic material, that is an entirely different matter.

Louis Frank: I think Dr. Anderson is in a measure absolutely correct. Simple perforation of the uterus, certainly when done during an operation under aseptic precautions and through an aseptic field, is absolutely no indication for opening the abdomen. I want to emphasize his statement concerning that particular point. However, a perforation made in the lower uterine segment, where there is not the contractile power there is in the fundus of the uterus, a perforation of a septic uterus certainly one in which the bowel may be damaged by the curette or in which a large hole is torn in the uterus in the process of curettment, is an entirely different proposition to deal with. So also are those perforations mentioned by Dr. Leavell and Dr. Wathen, i.e., perforations of the uterus during labor with expulsion of the fetus into the abdominal cavity.

I have seen a number of cases where abortions have been attempted by the introduction of various substances into the uterus without any harm resulting even when they wall off the uterus was perforated. I have seen knitting needles, sounds and various other instruments used in attempting abortions, thrust through the uterus and except for the wounds inflicted upon adjacent tis-

sues and infection which took place secondarily, there was practically no damage done.

It is well known that lacerations and perforations of hollow viscera, especially those located in the lower abdomen, are nearly always protected by the small intestine or omentum. This has been shown by subsequent operation where adhesions were found between the perforated viscus and the intestine or omentum. However, the same condition does not apply to the upper abdominal viscera in all cases because there are situations where a knuckle of intestine or portion of the omentum cannot get into the perforation and thus close it.

I remember to have seen this very strikingly illustrated in the case of a young man who sustained a rupture of the urinary bladder. Except for the primary extravasation of urine there was no further leakage into the abdominal cavity. The rent in the bladder wall was blocked by a section of small intestine. I believe such cases are more common than we have heretofore suspected.

In the case reported the sigmoid had remained in the vagina for several days when the patient was admitted. The expulsive efforts of the uterus had obstructed the circulation and sloughing of the sigmoid had already occurred. Had an attempt been made to return the intestine to the cavity and do an immediate resection under such circumstances, the patient would probably have succumbed on the table. There was no other way of handling the case except as the reporter has stated.

I want to endorse what Dr. Anderson has said, that simple uterine perforation is not, per se, an indication for abdominal section, although we were taught that it must be regarded as a very dangerous accident. When the uterus is perforated with the patient under an anesthetic, there is no reason why the accident should be accompanied by anything like the degree of shock that we have from a four-inch abdominal incision,—and we know there is usually no shock following the latter procedure. We forget that these patients do not lose any blood and there is no reason why there should be any shock. If there has been any escape of septic material, and the patient is not under the influence of an anesthetic, then we may expect shock and also pain and with the least suspicion of infection, or hemorrhage, the abdomen should be opened immediately.

L. W. Frank (closing): In the case reported the sigmoid probably did not descend into the vagina of its own accord, it was evidently pulled through the uterine perforation by means of the curette. The intestine was badly lacerated and had a hole in it as large as a silver dollar. The uterine perforation was just above the internal os. Later developments showed that the sigmoid was rather redundant, and it must have

been engaged with the curette and pulled through the uterine perforation.

The patient had only a mild degree of peritonitis. The sigmoid being drawn through the uterine perforation prevented the escape into the abdominal cavity of any discharge from the uterus. Of course there was a "double loop" of the sigmoid in the vagina, and the hole was about in the center of the protruding portion. The sigmoid was considerably elongated with facilitated resection as it was easily delivered through the abdominal incision.

At the time of the first operation the uterus was the size of a two or three months pregnancy. When the abdomen was opened the second time the uterus had become normal in size and consistency of the tubes and ovaries normal, consequently no operation was done on these organs. I simply closed the perforation in the uterus and brought the peritoneum together over it. As the sigmoid had been so long in the vagina, although resection was made in healthy tissue, pelvic peritonitis was feared, and for that reason tube drainage was used. The tube was removed on the second day, drainage having ceased.

In regard to uterine perforations in general: The majority of them occur either in attempted abortion or in curettment after abortion has been produced. In most of the cases where curettment is done following abortion infection is already present, and of course then uterine perforation is a serious matter. I have seen one case where there was a small uterine perforation following curettment where abortion did not occur, there was retained placenta of three days duration, and the woman promptly died of peritonitis. In another case, during curettment preliminary to abdominal section, a small perforation was made in the uterine wall. The woman had no shock and I doubt whether the small uterine perforation would have caused any trouble, but we took the precaution to close it just the same.

Prophylaxis of Diphtheria in Boarding School.

—Two cases of diphtheria developed among the 600 girls of the school. They were isolated and ten carriers were found among those that sat near them at table and class. The carriers were isolated, but another case developed, and it was found that the places at the table left vacant by the isolated had been filled by other girls. This resulted in discovery of eleven more carriers. When this practice was stopped, there were no further cases. Some of the carriers showed virulent bacilli up to 122 and 132 days. Possibly the Schick test might reveal which of the carriers are less liable to be contagious as they possess antibodies enough to attenuate the diphtheria bacilli.

CASE FOR DIAGNOSIS.*

By JOHN J. MOREN, Louisville.

E. E., aged 52, butcher by trade. Healthy man, practically no illness during his adult life. He reported to Dr. Hester about Dec. 5th, with blurred vision, and dizziness, with the history of having drunk some "moonshine," and he feared that he had gotten hold of wood alcohol. Dr. Hester makes the following report:

"Few choroidal spots in right eye, left negative. On account of blurred vision the test for the field vision was not very satisfactory, though he thought it was somewhat contracted. Color tests were negative. Strychnia was administered in ascending doses, and patient was thought to have improved. On Jan. 5th his vision was practically 20-20, but his dizziness and headache persisted and on transillumination the left ethmoid was thought to be involved. On January 28th a sub-mucous resection was done. At no time during this period was any temperature noted. The urine and Wasserman were negative. During the first week of February Dr. Hartman, the family physician, was called. He noted at this time a blood pressure of 220. Blurred vision would come and go, as well as his dizziness."

I examined the patient about March 1st. He complained particularly of occipital headache, vertigo, occasional blurred vision, no involvement of reflexes, no nystagmus, no motor or sensory sign. Blood pressure still in the neighborhood of 200, pulse not rapid and general symptoms sufficient for me to conclude that his trouble was from arterio-sclerosis. I thought this would account for his vertigo, high blood pressure, etc. He made no improvement. Deafness increased, and he evidently had tinnitus, as he would say to his family, don't you hear the dogs barking, etc. At times he would imitate a dog barking or a rooster crowing or something of that kind. About the 10th of March he developed a hicough, with a temperature of 100, pulse accelerated, blood pressure 180. Four days later difficulty in swallowing appeared. His deafness increased, and sight more blurred, became unconscious and remained so for about four days. Hicough persisted until death, March 22nd.

Dr. Zimmerman reports the following post-mortem findings:

1. The dura was everywhere apparently normal.
2. There was a well-marked injection of

the vessels of the pia-arachnoid. A condition of hyperaemia over the entire cerebral cortex.

3. The basal cistern contained a considerable quantity of clear fluid.

4. There was no apparent oedema of the brain at any point.

5. Transverse serial sections beginning at the lower end of medulla showed microscopically as follows:

(a) No lesions in the medulla. The ventricle and choroid plexus normal.

(b) No lesions in cerebellum.

(c) Numerous small hemorrhagic areas throughout the entire pons—more marked in tegmental portion. These areas were most numerous at about the level of the superficial origin of the 5th nerve.

(d) Nothing abnormal found in mid-brain, basal ganglia or cerebral hemispheres.

Dr. Graves reports the following:

Gross Description: Specimen consists of several portions of brain including cerebral cortex, pons and medulla. Cross section of pons shows few small hemorrhages. Basilar artery shows white plaques.

Microscopical Diagnosis: Sections show slight infiltration of pia-arachnoid with lymphocytes, plasmas and endothelial leucocytes. No evidence of hemorrhage or perivascular infiltration.

DISCUSSION:

Stuart Graves: Portions of the cerebral cortex, basal ganglia and cerebellum removed post-mortem in this case were sent to the laboratory. We made sections through these parts. The microscopic sections showed a very low grade of chronic inflammation of the pia-arachnoid. There was no particular peri-vascular infiltration nor any of the conditions usually seen in encephalitis. There was no evidence of acute infection.

S. J. Meyers: I wish to refer to only one feature in connection with the case Dr. Moren has reported. He makes the statement that his patient had extreme hypertension, and yet there was no evidence of either a cardiac or renal lesion. I do not believe we ever have the degree of hypertension mentioned (220mm. Hg.) persisting for any length of time without involvement of the heart or kidneys or both.

I have recently had under observation a case of hypertension in which the urine was absolutely normal so far as could be determined by chemical and microscopical examination, and yet when we made a phenolsulphonephthalein test the rate of excretion was found very low.

Another thing that suggests itself to me is: In most of the cases of hypertension I have seen it has been found, not by clinical examination always, but if you will take the trouble to make a fluoroscopic or radioscopic examination you will find some change in the heart or the aorta. Most

*Clinical report before the Louisville Medico-Chirurgical Society.

of the cases of this kind I have seen in the last six months have had aortitis. Those men who are doing much work with radiography or fluoroscopy will bear out this statement, that a great many of these hypertension cases show changes in the aorta.

Some light may be thrown on these cases, also, by careful blood chemistry.

Leon K. Baldauf: It is difficult to say just what was the matter with Dr. Moren's patient, but from the high blood pressure it looks to me like a case of renal disease.

In regard to the whole proposition of hypertension: I do not believe any of us know much about it. I question whether hypertension in every case means renal disease. I have been doing considerable work during the last month in hypertension cases. Many of the doctors have been kind enough to permit me to study their cases, and probably in the last two weeks I have had thirty cases of hypertension. Some of them showed blood pressure of 300 mm. Hg. I think if there is any one thing in medicine about which we know little it is hypertension.

It is undoubtedly true that some cases of nephritis are associated with high blood pressure, but there are many cases of hypertension which originally were not associated with changes in the kidney. The changes found in the heart or the kidney are the result of hypertension and not the cause. This idea is not original with me. Such an authority as Barker believes that many of these hypertension cases are associated with disease of the ductless glands. I am inclined to believe we are going to find the ductless glands have a great deal to do with high blood pressure.

I have under observation a boy aged twenty-two years with a blood pressure of 160 for which no cause can be found. I even made an electrocardiographic tracing in this case which showed nothing abnormal without left ventricular preponderance. I believe it is a case of essential hypertension without organic change.

It is not good policy to be too dogmatic about this subject, because the whole proportion of hypertension will probably have to be rewritten in the near future. While I was in the Mayo Clinic they were doing considerable work with this class of cases.

I believe we are going to know a great deal more within the next few years about hypertension than we know now.

C. W. Dowden: I recently presented before the Southern Medical Association a paper in which I detailed the study of quite a large series of kidney cases with especial reference to the blood chemistry, phthalein output, etc., in connection with the blood pressure. There were any number of cases in that series in which, if we could place any dependence on the output of phthalein and on the blood chemistry, the kid-

ney so far as its function was concerned was absolutely normal, yet the patients had an extremely high blood pressure. In one case I have in mind, a prominent man who died within the last few months, repeated tests were made and he always had a normal output of phthalein with a blood pressure of 225 mm. Hg. all the time.

In Dr. Moren's case it seems to me the hypertension probably offers a clue to the diagnosis, i.e., that the man had kidney disease. We know in the arterio-sclerotic kidney and in certain types of interstitial nephritis the urine has a low specific gravity. One may have to search repeatedly before any casts are found, yet kidney filter is interfered with and the urine has the appearance of clear water.

The hypertension and headache in the case reported might easily be accounted for by the presence of uremia. The blood chemistry would probably have shown that the man had uremia. I think that is the most probable explanation. The hypertension and other symptoms presented would be consistent with this diagnosis.

J. G. Sherrill: Evidently the patient in the case reported did not have sufficient observation. It seems to me that a man who has uremia will show at some time, in the urine, evidence of a kidney lesion.

Dr. Moren did not make it clear whether the eye grounds of his patient were normal. Patients do not die of uremia with normal eye grounds. There must have been some lesion, probably in the kidney, to account for the symptoms Dr. Moren has described. I am willing to admit that one examination of the urine is not a satisfactory method of determining whether the kidney is diseased or not; but I do not believe can have fatal uremia without some evidence of change in the eye.

We know that sudden fright, sudden disappointment, grief, etc., will sometimes change a low blood pressure into a very high one, and I want to agree with Dr. Baldauf that study of the ductless glands should be made before we can determine definitely about these cases.

In the case reported the patient was not subjected to all the tests that might have been employed in making the examination, and above all the necropsy was imperfectly made. Such post-mortem examinations afford no definite information. Many of us do not recognize the importance of having necropsies conducted in a systematic manner, nor do we realize the valuable information which may be thus obtained.

We can learn very much in the study of a case by obtaining a complete history. If a case is reported in an incomplete manner we are unable to judge as to the condition present. In Dr. Moren's case there are certain symptoms indicating brain trouble. There was congestion of the cortex and inflammation of the pia arachnoid.

This might be due to Bright's disease, but in that event the eye grounds would certainly have shown some evidence of that condition. Edema of the brain might produce similar symptoms, and I believe this is a frequent factor in the production of troubles of this kind.

J. Rowan Morrison: In regard to hypertension: I do not believe we know nearly as much about this subject as we are likely to know in the future. Dr. David Reisman in the meeting of the American Medical Association at Atlantic City, in 1919, reported a number of cases of hypertension in women where careful study failed to demonstrate any trouble with either the heart or kidney.

I now have under observation a woman who has had constant high blood pressure for a number of years without any evidence of cardiac or renal lesions. She not only has high blood pressure but myxedema. She was given thyroid gland substance for several years.

There are many things to be considered in cases such as Dr. Moren has reported. I believe it is possible to have nremia without eye ground changes. All the evidence in this case point to the fact that the man had renal disease.

John J. Moren (closing): I believed this man had some vascular disease, that was my opinion. Dr. Graves' report shows there were white plaques in the arteries. I do not mean to say there was no disease of the heart or kidney, but there was no manifestation to indicate kidney disturbance nor was there any embarrassment of cardiac function. There were no symptoms of either cardiac or renal disease. He had no evidence of nephritis of any type. In my opinion all his symptoms were cerebral in origin.

The interesting point to me is that a man aged fifty-two years suddenly developed dizziness, disturbance of hearing and visual symptoms, regardless of the fact that he had high arterial tension, and then five weeks later he had temperature of 100 degrees F. and developed hiccough, and within two weeks he was dead.

Previous to this illness he was a healthy robust man. His family physician has known him for fifteen years and he had never consulted him for any illness. The question arose in my mind whether this might not be one of those cases of epidemic hiccough. That is a question which I cannot answer.

Dr. B. F. Zimmermann made the necropsy. We were only permitted to remove the brain. The whole brain was sectioned and carefully examined, taking pieces from the cerebrum, the pons and the medulla.

NEWS ITEMS AND COMMENTS

A MODEL COUNTY POOR FARM.

"County 'poor farms' are usually badly managed. They are in fact poor farms for they house poor people on land which has grown poor through poor management."

The above paragraph heads an article which appeared in a recent issue of the "Southern Agriculturist," describing the rather spectacular results obtained in Daviess County, Kentucky, by the County Court and Commissioners there, who have not only demonstrated that the fertility and productivity of a "poor farm" could be increased, but the home and farm managed in such a way as to compare with any other home or farm privately owned and successfully operated.

A representative of the State Board of Health recently visited this county poor farm and reported on the remarkable change made there in the short period of two years.

Under the direction of the county physician, Dr. Kirk, the housing conditions have been remarkably improved, all the buildings thoroughly renovated, painted, screened and modern conveniences for the comfort of the inmates installed. An electric lighting system and water system which provides for shower baths and indoor toilets, with a septic tank for sewerage disposal of the Kentucky Sanitary Septic type have been installed. There is provision for adequate fire protection, a safe water supply and a concrete storage house for all food products.

The inmates are all happy and contented, and there is every evidence that the management is of the kind that insures comfort and contentment.

All of this has been done with a moderate outlay of expense, and the report of the court shows that in the cost to the county there was saved in the conduct of the institution and farm over two thousand dollars in 1920, as compared with 1919; and the court expresses itself as believing that within a few years, under this system of management, the county poor farm will be practically self-supporting. Every physician in Kentucky and every county official should familiarize himself with the plan now operating in Daviess County, with a view to recommending the adoption of similar plans in their counties, keeping in mind that these wards of the county are entitled to every safety and comfort.

It is a pleasure to commend the County Court and Commissioners of Daviess County on this splendid demonstration.

Kentucky Medical Journal

PUBLISHED MONTHLY BY
THE KENTUCKY MEDICAL ASSOCIATION
Incorporated

Entered as second class matter October 22, 1906 at the
Postoffice at Bowling Green, Ky., under act of Congress.
March 3, 1879.

Subscription Price \$2.00

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ANNUAL MEETING, PADUCAH, 1922.

COUNTY SOCIETY REPORTS

Bourbon—The regular meeting of the Bourbon County Medical Society was held on Thursday evening, September 29th, at 7:30 p. m. at the Court House. A very interesting program was assured.

Wm. Kenney exhibited a specimen of twins—attached Siamese-like—in a case of report of a case with exhibition of specimen.

J. C. Hart, Clintonville, read a paper on "Practical Applications of Blood Chemistry,"

C. G. Daugherty gave a report of the Kentucky State Medical Association meeting.

M. J. STERN, Secretary.

Carlisle—The Carlisle County Medical Society convened in the Baptist church in Milburn for its regular quarterly session with the President, R. C. Burrow, in the chair. After invocation by Rev. Harrison, Rev. Stubblefield gave us a hearty welcome.

Committee on Arrangements reported that dinner would be served at the home of Dr. Gilliam.

Motion carried that all visiting physicians be made honorary members of our society, and that they have the privileges of same.

1 P. M.

The minutes of the previous meeting were read and approved, after which the regular program was taken up.

E. W. Jackson read a very interesting paper on Management of Acute Head Injuries.

E. A. Stevens opened the discussion. The paper was thoroughly discussed by all present. The essayist closed the discussion by emphasizing the fact that a fracture of the skull does not amount to anything, but the amount of injury done to the brain is the thing that concerns us most.

E. C. Walters read a very interesting paper on Splenic Anemia.

P. H. Stewart opened this discussion, which was followed by most doctors present.

W. L. Mosby and **H. A. Gilliam** read a symposium on Normal and Abnormal Menopause, which was very interesting and brought a thorough discussion by all present.

A vote of thanks was extended to the members of the Baptist church for the use of their house, and to all these excellent ladies and Mrs. Gilliam who contributed to the entertainment.

The visiting Doctors were E. W. Jackson and H. P. Stewart, of Paducah, E. A. Stevens, Hunt and Walters of Mayfield, W. E. Merrett, of Fancy Farm, and Moss and Peeples, of Clinton.

R. C. Burrow, J. T. Dunn, E. W. Jackson, R.

T. Hocker, H. A. Gilliam, M. R. Mosby, J. T. Marshall and G. W. Payne were present.

The Society adjourned to meet first Tuesday in December, at Bardwell.

GEO. W. PAYNE, Secretary.

FIRST ANNUAL MEETING OF THE PEDIATRIC SECTION OF THE KENTUCKY STATE MEDICAL ASSOCIATION.

September 19, 1921, Louisville.

Meeting called to order by Philip F. Barbour, the President.

First order of business was the papers.

Gavin Fulton read a paper on Nocturnal Enuresis. Discussed by J. W. Bruce, Fred Speidel, Bate, Pritchett and Barbour.

James Pritchett read a paper on Pyloric Obstruction. Discussed by Gavin Fulton, J. W. Bruce, P. F. Barbour.

James W. Bruce read a paper on Care and Treatment of Premature Infants. Discussed by James Pritchett, Gavin Fulton and R. A. Bate.

Business Session.

The constitution was read and adopted. Gavin Fulton and James Pritchett were elected to the executive committee.

All the officers of the preceding year were re-elected, i.e., President, Philip F. Barbour, Louisville; Vice President, Josephine Hunt, Lexington, and Secretary and Treasurer, J. W. Bruce, Louisville.

Those present included: W. O. Eaton, Ashville; Morris Flexnor, Louisville; Sam Myers, Louisville; Mary Hopkins, Louisville; Fred Speidel, Louisville; Juniata Jennings, Lynch; James Pritchett, Louisville; Arthur Goodman, Louisville; Henry E. Tuley, Louisville; R. A. Bate, Louisville; Dr. Shacklette, Louisville; Dr. Frey, Louisville; Gavin Fulton, Louisville; Philip F. Barbour, Louisville, and James W. Bruce, Louisville.

Constitution.

Art. 1. The name of the Society shall be the Kentucky State Pediatric Society.

Art. 2. The objects of the Society shall be:

1. To increase the interest of the profession of the State in Pediatrics.

2. To provide a means for doctors who are interested in Pediatrics to meet each other and engage in helpful discussion of Pediatric problems.

Art. 3. The officers of the Society shall be: a President, a Vice President, and a Secretary-Treasurer. These three officers together with two (2) other doctors who shall be duly elected at each annual meeting shall constitute an executive committee. This committee shall arrange a program and time and place of meeting.

Art. 4. The Kentucky State Pediatric Society shall meet once a year, preferably at the time

and place of the Kentucky State Medical Society.

Art. 5. Members—Any member of the Kentucky State Medical Society is invited to become a member of the Kentucky State Pediatric Society and to take part in its program and discussions.

W. BRUCE, Secretary.

Muldraugh—Regular meeting Muldraugh Hill Medical Society held August 11, 1921. Election of officers.

A. D. Wilmoth nominated G. G. Thornton, of Lebanon, for President. Dr. Thornton was elected unanimously. W. J. Shacklette, the retiring President, vacated the chair in favor of Thornton.

C. C. Carroll, White Mills, nominated present Secretary, but Aud declined and thanked the Society for their loyal support.

S. D. Winstead, Rineyville, nominated H. H. Hagan, of Louisville, for Secretary-Treasurer. Hagan was elected by unanimous vote.

Guy Aud, the retiring Secretary-Treasurer, read the financial report for the year. The report was adopted as read, by unanimous vote.

J. S. Lutz reported a case of sarcoma which developed after an automobile accident. X-Ray diagnosis of gastric ulcer had been made, but was not in accord with clinical symptoms.

A. D. Wilmoth, F. T. Fort, C. C. Carroll, Bernard Asman and Guy Aud discussed the paper.

Robt. Pirtle reported a case of compound epiphyseal separation which developed gas gangrene. Guillotin amputation of thigh at middle and upper third was performed. Prompt recovery and good stump obtained.

A. D. Wilmoth reported a case of stricture of oesophagus following drinking of concentrated lye. Gastrostomy performed, and dilatation of stricture to be undertaken later.

Bernard Asman in discussing this case reported two cases of stricture of rectum secondary to radical operation for carcinoma in which radium seemed to be producing satisfactory results.

Guy Aud stated that gastrostomy can be avoided in many cases by feeding thread through stricture and then guiding bougie down on thread.

G. G. Thornton reported a case of kidney colic in which X-Ray and cystoscopic examination had failed to give a definite diagnosis.

C. C. Carroll read a paper on "Fracture of the Elbow," and demonstrated a case which he had previously reported before this Society. A most excellent result was obtained and patient was shown to have perfect function of elbow. The case was discussed by Pirtle, Fort and Aud.

J. S. Lutz read a paper on "The Pregnant Woman—Her Duties to Herself and the Physician's Duties to the Patient."

B. M. Taylor in discussing the above paper stated that the physician should spend more time instructing expectant mothers and not do obstetrics merely to hold family practice. A mother does not know condition by instinct. Patient should be instructed in details and made to look forward to labour with anticipation of pleasure in offspring.

P. E. Blackerby thinks that too many doctors have given only ten dollars worth of service.

G. G. Thornton advised the use of printed forms giving detail instruction to the mothers.

It was impossible for **J. H. Pritchett** to be present and take his place on the program, so **James Bruce** kindly consented to lead the discussion on the subject, "Second Smimmers." Dr. Bruce gave a most excellent and instructive discussion of the clothing and food to be used during this period of childhood. **Lutz, C. C. Carroll, English, Taylor, C. C. Carroll** and **Pirtle** also took part in the discussion.

P. E. Blackerby and **Miss Peterson**, of the State Board of Health were present and gave a practical demonstration of Modern Laboratory and Scientific Methods of Preventing Incurable Diseases.

The papers of **Lutz** and **Bruce** will appear in the Journal.

This meeting was arranged primarily as a meeting to be open to the public, but was rather poorly attended by the public. However, it was well attended by physicians, and the discussions were unusually interesting and instructive.

H. H. HAGAN, Secretary.

Oldham—The Oldham County Medical Society held its regular monthly meeting at the City Hall on September 27, with the following members present: **J. W. Sams**, Prospect; **T. G. Connell**, H. B. Blaydes, R. B. Cassady, of LaGrange; **Lewis Coblin**, of Buckner; **Miss Inez Caudel**, secretary of the Red Cross; **Mrs. J. T. Dixon**, president of the Parent-Teachers' Association; **Mrs. R. L. Nutter**, **Miss Carrie Froh** and **Mrs. S. A. Sauer**, of the King's Daughters. The meeting was called to order by the President, **H. B. Blades**. The object of the meeting was to establish a free public clinic. This will be held at the Red Cross headquarters every Saturday between the hours of 8 and 9 o'clock, at which time medical advice and treatment will be given those who apply for it. In the event that the services of a nurse are needed one will be supplied.

The subject of visiting the schools of the county was discussed. It was decided that the health officer, in company with the doctor in the community of the school should visit each school in the county and make a record of each child. The Red Cross secretary gave the information that the National organization would furnish cards for that purpose. The cards will

be made out in duplicate, one sent to the parents of the child and one kept at the school. On these cards a statement of the child's condition will be made out with suggestions as to the remedial measures needed, if any. The civic organizations let it be known that if there are any children in the county who are kept away from school on account of not having sufficient clothing to wear, they would gladly furnish same, if they were informed concerning the cases.

Lewis Coblin was elected a member of the Oldham County Medical Society.

S. J. SMOCK, Secretary.

BOOK REVIEWS

General Pathology—An introduction to the Study of Medicine. Being a Discussion of the Development and Nature of Processes of Disease. By **Horst Oertel**, Strathcona Professor of Pathology and Director of the Pathological Museum and Laboratories of McGill University and of the Royal Victoria Hospital, Montreal, Canada. Cloth, Pp. 357, with illustrations. Price \$5.00 net. New York: Paul B. Hoeber.

It is not overpraise to state that this work of **Oertel's** is one of the outstanding books of the day. Written in a style that is commendable and in the scientific spirit without which every book on the subject of pathology falls short of being in the first rank, it gives the reader a thorough interpretation of all the problems in pathology, some of which no doubt have perplexed him on account of his limited knowledge, due to the fact that he has never been fortunate enough to acquire an illuminating book on the subject.

The subject of general pathology has too long been the bete noire among physicians in general, even among those who lay claim to being well versed in all subjects of medicine. The reason for this is that most physicians—the majority—have for some unexplainable reason regarded the study of general pathology as too abstruse and too wearisome a subject to cope with, and have relegated, on account of this attitude, its interpretation to those men in the medical profession who are specialists in pathology.

Any book on general pathology that has reasons such as the three mentioned above, has an asset which should bespeak a wide circle of readers; and when added to these are a simplicity of presentation and clarity of thought that are evidenced on every page, it cannot be gainsaid, in all fairness to the author, that at least the American medical profession has a book at hand that is of so unusual a nature that it must be considered a hall-mark in medicine.

KENTUCKY MEDICAL JOURNAL

BEING THE JOURNAL OF THE KENTUCKY STATE MEDICAL ASSOCIATION

Published Under the Auspices of the Council

VOL. XIX. 

BOWLING GREEN, KY., DECEMBER, 1921

No. 12

EDITORIAL

THE OHIO STATE MEDICAL JOURNAL.

The November 1st number of the *Ohio Medical Journal* has just come to our desk and, while we rarely feel that it is justifiable to make individual distinctions, we believe this is the best number of a medical journal that we have ever read. From cover to cover it is full of interest. Its advertising pages are clean, and there is hardly any want of a physician that some one does not offer to supply.

The editorials are timely, concise, and well written. A symposium on Fractures, and the Medical-Defense Aspect of Fractures is one of the most practical and valuable we have ever seen.

A most interesting description of public health work in an Ohio county holds one. There are a number of purely scientific articles which are of especial interest. An address by Ochsner on the Future of Medicine as Affected by Ultra Specialization is one of the finest things we have seen, and we will reproduce it in the JOURNAL.

An especial notice calls the attention of the physicians of the State to the importance in the management of the diphtheria epidemic in the following:

"Consider every case of sore throat as possible diphtheria until the contrary is proved.

"Give an adequate dose of antitoxin to every case you suspect of diphtheria immediately.

"Submit cultures from all cases of sore throat.

"Consider every case of croup which does not yield to ordinary remedies in a few hours as a true case of membranous or diphtheritic croup and give an adequate dose of antitoxin.

"Locate a physician capable of intubating

and call him at once in all cases of membranous croup.

"Give antitoxin to all persons exposed to diphtheria.

"Do not ask the health commissioner to release any case of diphtheria until two release cultures taken consecutively are negative.

"Never wait for bacteriological confirmation of your diagnosis before giving antitoxin.

"Remember that if antitoxin is not given early enough diphtheria toxin will become fixed to the tissues and converted to toxone which antitoxin is powerless to neutralize.

Remember that a large percentage of persons who come in contact with diphtheria, including doctors and nurses, become carriers and may spread the disease without themselves suffering from it.

"Familiarize yourself with the Schick test and with toxin-antitoxin which gives fairly permanent immunity. Urge your families to test and protect their children by this means. Remember, however, that there is only one way to deal with an actual contact, and that is to give an immunizing dose of antitoxin immediately. It does not pay to temporize with the Schick test and with toxin-antitoxin in the presence of an actual contact, for the immunity conferred by this means takes too long to develop to be of value. Immunity conferred by antitoxin is effective immediately but passes off quickly.

"Lastly, have the thought of diphtheria constantly in the back of your mind so that no obscure case of nasal or laryngeal type will escape detection."

The issue closes with reports from the County Societies, and they are good ones.

The congratulations of this JOURNAL are extended to Editors McMechan and Martin, and their staff for a corking good medical Journal, and to its advertisers in their wise choice in their selection of a splendid medium for their advertisements.

ANNUAL MEETING.

During December, practically every County Society in the State will hold its annual meeting and elect its officers.

At its recent meeting, the Council requested the Societies to be particularly careful in selecting their presidents and secretaries. Re-elect those officials where the work is being well done, particularly keep in office the experienced secretaries. Do not hesitate to elect a new man in the counties where the work is not being well done, as the secretary is the absolutely necessary officer in the basic work of the County Society.

The County Society determines the value and standing of the profession of each particular county. Where there is no Society, and where it does not do regular, systematic, and effective work, the people do not respect the profession, prosecutions against quacks and impostors fail, and members of the profession are found constantly grumbling and quarreling not only against each other, but against the profession and the world in general.

Get together! Meet regularly and stop knocking! Remember your County Society and State Medical Association are the most democratic bodies in the world, that they deserve your loyal, active support, and they will do you good in the exact proportion, and only in such exact proportion as you work in and for them.

DR. SOUTH RESIGNS.

Below, we are publishing the telegrams exchanged between Dr. John G. South, retiring President of the State Board of Health, who has just been made U. S. Minister to Panama, and the State Health Officer.

FROM 1908 TO 1921 IN PUBLIC HEALTH.

When Dr. John G. South was elected President of the State Board of Health in 1908, its total appropriation and income was \$5,000 per year, and it was housed in the residence of the Secretary at Bowling Green. He had to practice medicine actively and spend largely from his own funds to carry on the State's health work.

In 1921 the income of the Board is about \$250,000, and it is housed in its own five story building at the corner of Sixth and Main streets, Louisville, with seventy-five people in its building, and more than two hundred All-Time health workers in various parts of the State. It is really accomplishing the purpose for which its farseeing founders designed it.

Since 1908, more than 200,000 persons with hookworm disease have been relieved. The Kentucky Sanitary Toilet has been designed

and its rapid building in schools and in homes is decreasing diseases due to soil pollution. Popular health education has decreased deaths from tuberculosis 40 per cent; deaths from measles, diphtheria, whooping cough and scarlet fever have been reduced 50 per cent; the average child born in Kentucky in 1921 will live eight years longer than if it has been born in 1908.

In 1908 there was not one person in Kentucky devoting their entire time to public health work. Now ten counties and one city have an All Time health officer, and forty other counties have All-Time public health nurses. Kentucky has a small but model State Tuberculosis Sanitarium. It has developed a School of Public Health where it is training Health Officers and Nurses to solve the problems of public health. It has the best physical education law in the United States.

These are outstanding things which have been accomplished while Dr. John G. South has been President of the Board, and in his resignation to the Governor, Dr. South telegraphs from Washington that he trusts the work of the Board may go on through the years to come guided in the same efficient and enthusiastic manner in which it has been conducted for the past fourteen years.

It is peculiarly fitting that Dr. South has been sent as Minister to Panama where the model sanitary work of the world has been carried on, and it was largely in recognition of the splendid sanitary work that he has done in Kentucky that he was selected by President Harding.

DR. SOUTH'S TELEGRAM TO THE STATE HEALTH OFFICER, AND HIS REPLY TO SAME.

New York, N. Y., Nov. 1, 1921.

Dr. Arthur T. McCormack, Secretary,
Kentucky State Board of Health,
Louisville, Kentucky.

Having accepted a foreign post I must now resign from the Presidency of the Kentucky State Board of Health and from the Board. It is with inexpressible regret that I must retire from a work in which I have so profound an interest. Having served fourteen years as a member of the Board I have formed associations and friendships that I shall always cherish and hold most dear. Please convey to each member of the Board and to each and every one connected with the work my best love and wishes. It is with special regret that I must sever my official connection with you and your dear, dear father. He and you have served the grand old State long and well. For Kentucky's sake I pray that you continue

in your able and self sacrificing work and I wish you all God speed.

J. G. SOUTH.

Louisville, Ky., Nov. 2, 1921.

Doctor John G. South,
Washington, D. C.

It is with more regret than I can tell you that I am transmitting your resignation from the Board and its Presidency to the Governor.

Immediately associated with you for the fourteen years you have been its President, the members of the Board desire me to transmit to you their appreciation of the faithful and loyal service you have given to the promotion of the health of the people of Kentucky. Although serving without compensation, your official duties compelled you to give up a most lucrative private practice ten years ago, since which you have given unstintingly of your time, energy and thought to this work in which you have been recognized nationally as a leader. During this period the sick and death rate from all the preventable diseases has been decreased from twenty-five to fifty per cent. Hundreds of well Kentuckians who would have been prematurely dead are your reward for the sacrifices you have made for them. The medical as well as the sanitary profession of Kentucky join in praying for you the greatest success as the representative of our County to the kindly and generous people of the Republic of Panama, and wish you and Mrs. South God speed and God's care in your voyage and in your new field of work.

A. T. McCORMACK, Secretary.

Surgery of the Ileocecal Valve.—Lefebvre gives an illustrated description of the best means for correcting insufficiency of this valve of reflex origin, from paralysis or dilatation of the bowel, or of organic origin from insufficiency of the muscle, or disease; also treatment of stenosis of this valve. Insufficiency is usually the cause of disturbances in this region, especially of pain in the right iliac fossa, too often ascribed erroneously to chronic appendicitis.

Russell's Fuchsin Bodies.—In the course of a study of 100 specimens of dental granulomas, not abscesses, McConnell and Lang were struck by the frequent occurrence of Russell's fuchsin eighty-six of the cases containing them in greater or less number. Further study of these bodies leads them to believe that they are the result of degenerative changes occurring in the cell protoplasm but not in the nucleus. The type most commonly affected is the plasma cell, but any other variety of tissue cell may undergo a similar degeneration. The red blood cells are not concerned in their formation.

ORIGINAL ARTICLES

SYMPOSIUM ON MALIGNANCY

CANCER OF THE BREAST.*

By J. GARLAND SHERRILL, Louisville.

A great amount of study has been given to this subject, yet we are apparently but little nearer its complete solution than was the case fifty years ago, when Gross made his classic contribution. It is important, however, to place the results of research in this direction before the profession so that through it the laity may be made cognizant of the grave danger of delay in bringing affections of the mammary gland under the care of a competent attendant.

The percentage of cures from radical surgical removal is increased considerably over the earlier results; still this is by no means brilliant. The deaths from cancer of the breast per thousand fatalities is higher within recent years, (63 per 100 in 1909 to 81 per 1000 in 1915, from U. S. Registration Area) particularly in the centers of population.

This increase is due in part to more accurate diagnosis and registration, and in part to a rather evident increase in the disease, the latter fact is shown by recent reports of its development in women as young as sixteen years of age. Undoubtedly the smallest mortality will follow early and radical removal of malignant breast tumors supplemented by judicious use of radiation, by the Roentgen ray or radium, than by any other known method of treatment.

It must also be recognized that among a large percentage of the laity the dread of malignant disease is so great, being accompanied by the belief that cancer is a hopeless disease, that there is a tendency among those so afflicted to conceal the fact that they have a tumor in the breast. Oftentimes such patients first apply for examination after the disease has progressed to a stage where the chance of permanent relief by any method of treatment is greatly diminished.

I recall the case of a woman aged seventy-five years, by whom I was consulted because of marked edema involving the left arm. Immediately upon seeing the arm, inquiry was made of her concerning the presence of a tumor in the corresponding breast, and she replied that she had none. I insisted upon an examination, which proved that my suspicion was well founded; she was suffering from advanced scirrhus with marked glandular involvement in the axilla and neck.

It may be said that there are four factors

*Read before the Kentucky State Medical Association, Louisville, September 19, 20, 21, 22, 1921.

which act in causing delay in the application for surgical aid: (1) The mass may not be discovered; (2) timidity and ignorance of the patient; (3) inattention on the part of the physician first consulted; (4) the erroneous impression that cancer is hopeless. There is also an impression prevalent, not only among the laity but also the profession, that pain is an early symptom of mammary cancer; this is entirely without foundation, since pain is a late rather than an early manifestation. However, this belief often causes patients with mammary tumors to delay consultation.

Periodic pain in the breast is often neuralgic in type. This is a feature which must be constantly borne in mind, and while it should call for examination, does not mean that cancer is present, without other signs.

The subject of mammary neoplasms is worthy of careful consideration at this time for two reasons: (1) To urge upon the profession the necessity of a campaign for education of the public, so that these patients may promptly come under skillful surgical care; (2) to emphasize the fact that the diagnosis of breast cancer in the early stages is by no means easy even to those most experienced in such work, and consultation with an expert is most desirable in perfecting the diagnosis. Some cases are so puzzling that a final conclusion can only be reached after a pathological report has been added to the clinical and operative findings.

The classification and nomenclature of mammary enlargements have been somewhat confusing, and certain lesions have received so many different names that the student of this subject fails to acquire a fair idea of the existing pathology; for instance, the following terms are all applied to the atrophic changes occurring at the menopause, viz:

(a) Chronic cystic mastitis (Koenig); (b) interstitial mastitis (Virchow); (c) cystadenoma of the breast (Schimmelbusch); (d) cystic disease of the breast (Reclus); (e) chronic mammary tumor (Cooper), etc. The expressed views of various medical authors also show that much confusion exists among members of the profession concerning the subject. The descriptions given by different writers so closely correspond to the atrophic changes occurring with age, that there is a possibility that these changes have been mistaken by some observers for malignancy, when they are simply senile and normal. There are instances, however, where chronic interstitial inflammation of the mammary produces certain pathological alterations resulting in hyperplasia and contraction of the fibrous tissue. In these cases the connective tissue during the process of contraction compresses the secreting acini and the ducts, thus

inducing atrophy of the glandular tissue, while at the same time small cysts may be formed by occlusion. It is undoubtedly true that, in some of the cases of chronic interstitial mastitis, careful study of the pathology will disclose in one portion of the breast a normal histological picture, while in another chronic inflammatory changes may be noted, and still another portion may be suspicious or certainly malignant in type.

To simplify the study of mammary enlargements, the writer will divide them into: (1) Cysts, and (2) Tumors; always remembering that both may be simultaneously present in the same individual. The most important clinical division of tumors is: (1) Benign; (2) Malignant.

The patient is more particularly interested in the question of malignancy and recurrence, the pathologist in the cellular changes taking place in the neoplasm.

MacCarty has proposed a very interesting pathological classification which will do much to simplify the study of tumors involving the mammary gland. He contends that the question whether a neoplasm is benign or malignant can be determined at the time of operation by an examination of the tissue, basing his opinion upon the finding of cellular hyperplasia, and supporting his contention by cases taken from the Mayo clinic. His classification is as follows: (1) Primary epithelial hyperplasia (not carcinoma); (2) secondary epithelial hyperplasia (probably carcinoma); (3) tertiary or wandering hyperplasia (carcinoma).

The writer is not yet ready to admit that there is no danger of the dissemination of malignant disease by incising such neoplasms to secure specimens for microscopic examination, to be followed by immediate removal if the tumor is reported suspicious or malignant. Theoretically contamination is possible, and in a few instances in my own experience such accidents seem to have happened. MacCarty's report, however, seems to show such contamination to occur but rarely. Another point is the possibility of error, since one portion of the tumor may be benign and another malignant, and to avoid mistakes a number of sections must be examined.

The advantage of this plan of procedure is that the breast may be preserved in all simple neoplasms, and a wide operation performed, based upon accurate knowledge in those which are certainly or suspiciously malignant. Examination of a frozen section at the time of operation is indicated when there exists a reasonable doubt as to the correctness of the diagnosis, but in all other instances where the clinical history and the physical findings

point strongly to malignancy, a radical operation should be performed and the tumor subsequently submitted to the pathologist.

The most important feature in connection with this entire subject appears to me to be the diagnosis during the early course of the disease, and to this fact I shall address myself somewhat at length. In the late stages, the type can make a correct diagnosis.

There are so many important facts to be considered in making a differentiation of the exact character of the tumor, that one may be pardoned for giving rather explicit and even elementary instructions concerning proper examination of the breast. First: A very careful anamnesis, with especial reference to traumatism, child-bearing, heredity, tuberculosis, lues; the size, location, inception and rapidity of growth; pain, glandular enlargement, the presence of ulceration and discharge. Second: Inspection, both breasts being exposed and compared as to size, mobility and outline; also retraction of the nipple and pig-skin appearance should be noted. Third: Palpation, which I consider the most valuable of all means at our command. If not properly employed, however, it may be worthless. Very little information of value can be secured by pinching the breasts between the thumb and fingers; the proper plan is to place the palm of the hand flat upon the breast and gently press the gland against the chest wall. This will reveal any abnormal mass, show whether or not it is indurated, determine its mobility over the chest wall or the pectoral muscles, its mobility under or attachment to the skin, its outline and elasticity, whether encapsulated or not, also the amount of pain produced by pressure. By gently sliding the breast over the pectoral muscles with the palmar surface of the examining fingers, its attachments may be readily determined, and dimpling of the skin, with the slight fixation occurring in cancer, can be detected. Palpitation also discloses enlargement of the axillary and cervical glands, if any be present.

Certain characteristics are noted in benign mammary enlargements, whether cystic or solid in type: (1) They may occur at any age, often in the young; (2) they grow slowly or not at all; (3) they are encapsulated and never infiltrate into the surrounding tissues; (4) they are mobile on the fascia and under the skin; (5) there is no glandular enlargement; (6) they are usually painless excepting in certain neuralgic states; (7) they occur most often in unmarried and nulliparous women; (8) there is no retraction of the nipple. Malignant mammary tumors usually occur: (1) After the age of thirty years, but sometimes as early as eighteen; (2) they usually grow slowly but constantly if carcinomata;

rapidly and spasmodically if sarcomata; (3) the carcinomata are not encapsulated and soon infiltrate; the sarcomata are encapsulated at first and later infiltrate; (4) They are early attached to the skin and fascia; (5) There is early glandular involvement in carcinomata; retraction of the nipple is present in a considerable percentage and is strong evidence of malignancy; (6) Pain is not an early symptom, but is always present in the later stages; (7) Malignant mammary tumors usually occur in the women who have borne children. The irregular outline and induration gradually merging into surrounding tissue is characteristic of scirrhus; (8) Discharge from the nipple in a non-lactating breast is a suspicious but not certain evidence of cancer. Inflammatory conditions and tuberculosis can usually be differentiated if careful physical examination and a study of the history is made.

It is not always easy to differentiate between adenoma, adeno-cystoma and cystoma, and a cystosarcoma and adenocysto-carcinoma of the proliferating type are difficult to distinguish. Again, there are borderline cases, where pathologically the tissue is benign in one portion and malignant in another, as seen in the chronic cystic mastitis of Koenig. In such instances histological examination at operation is imperative to determine the best plan of operative procedure.

The prognosis is of great importance and is necessarily based upon accuracy in diagnosis. Even if the diagnosis be correct, much judgment must be exercised in making a prognosis to the patient. For this reason all mammary tumors should be submitted to the pathologist for examination and report, so the surgeon may give an accurate opinion of the final outcome. It is almost as serious an error to inform the patient that she has an incurable malady and see her fully recover, as it is to tell her that she has a simple tumor and need not fear a return when the neoplasm is malignant. Much judgment and tact should be employed in these cases. It has been my custom never to inform the patient that she has a cancer, unless she asks the direct question; under such circumstances I do not hesitate to tell her the truth. This is more especially true of patients who do not come to operation. Again, I wish to urge correct diagnosis as the only basis for proper prognosis.

Before closing I desire briefly to discuss operative procedures: In benign neoplasms, accessible on the posterior surface of the breast, attack may be made through an incision in the fold beneath the gland crescentic in shape, as proposed by T. Gaillard Thomas and later advocated by Warren. This route can be

employed for mammary abscesses, cysts, adenomata, etc. The advantage is that it causes no disfiguration. Of course, if the tumor is near the skin on the anterior surface of the breast, it can be removed by incision over the enlargement. Exploratory incision can be made the same way.

Operation for mammary cancer, in the opinion of the writer, when the diagnosis is certain and no tissue is needed for examination, is best performed as follows: A wide incision, beginning below and inside the breast, at least two inches away from the margin of the tumor at the nearest point, is carried upward and outward to the shoulder and downward along the arm above the pectoral insertion. The inner portion of this incision is only outlined, not extending deeper than the skin. The outer portion extends through the fascia. A similar incision is made below the gland and joins the first above the anterior axillary fold. The flap covering the axilla including the fascia is carefully dissected, the pectoralis major muscle is divided at its insertion to the humerus, and the main vessels exposed. Rapid and careful dissection of the axilla is made, the smaller vessels being doubly clamped and cut, torsion or ligature being used for permanent hemostasis. When the axilla has been thoroughly cleared and all glands from its apex and posterior border removed, extirpation of the breast proper is accomplished with a few rapid cuts with the knife in the lines of the incision already described. This can be done in a few minutes with little loss of blood, as the main vessels supplying the gland come from the axillary artery and have been occluded in the early stage of the operation. The remaining vessels are controlled and the skin loosened on each side of the wound for two or more inches, so that closure can be accomplished with facility.

By following the technic which I have briefly described, manipulation of the gland is reduced to the minimum. In my opinion it is rarely necessary to remove the pectoralis minor muscle, because it is not often infiltrated with cancerous tissue, unless the tumor is situated in the upper and inner quadrant; but in most cases the pectoralis major together with the fascia should be completely extirpated. If a few fibres of the pectoralis major above the range of the lymphatics are left, greater mobility of the arm may be secured.

Someone has observed that the man who is to close a breast wound should not make it, because the temptation to spare too much skin is great. I think the surgeon should know just how much skin it is necessary to remove, and nothing should prevent him from taking the proper amount away; but he should al-

ways bear in mind the fact that convalescence is shortened by primary healing of the approximated flaps, and also that the irritation of slow healing from separation of skin margins may favor recurrence.

In cases where great tension is present in approximation of flaps, it has been found advantageous to separate the skin and fascial flaps for four or more inches from the wound margins. Usually this permits approximation without tension, but sometimes it is necessary to make a sliding flap of skin from the abdominal wall. In exceptional cases, in very thin individuals the wound may be left open. In all other instances the wound, after complete hemostasis, is closed throughout without drainage.

I do not recall a local recurrence following any of my operations for mammary cancer during the last ten years. Prior to that time I reported the case of a woman who four years after the primary operation had a recurrence in the opposite breast. This second breast was extirpated, and two years thereafter she had a recurrence in the uterus. Subsequently she developed cancer of the abdominal viscera, marked ascites occurred, and she died from general carcinomatosis. This patient lived seven years after the primary operation, and prior to the development of ascites suffered little pain or discomfort. The case is merely mentioned to show that even where ultimate fatality cannot be prevented, freedom from suffering may be secured after operation.

Nearly all my recidivments have been visceral, and the result of delay in application of the patient for treatment. I believe that before undertaking amputation of the carcinomatous breast, with marked axillary and certainly with cervical glandular enlargement, an x-ray examination of the chest should be made. In my experience, carcinomatous glands in the chest can only be recognized by radiogram when marked involvement has occurred, and on this account cannot be of much service early in the case. If, however, such shadows are found, the case is undoubtedly inoperable.

I have been forced to the conclusion that palpable glandular enlargement in the neck (supra clavicular region) is fairly presumptive evidence of mediastinal metastasis, and if at all marked is a contraindication to surgical intervention. One should not overlook the fact that growths situated in the upper and inner quadrant of the breast show very early involvement of the mediastinal glands, because of the lymphatic vessels accompanying the perforating arteries through the chest wall. Such cases require very early and wide extirpation.

Recent observers have advised roentgeno-

therapy prior to operative intervention as a preventative of recurrence. It is claimed that infiltration of the tissues surrounding the tumor can thus be obviated, and blocking of the lymphatic capillaries by the leucocytes establishes a fortification which prevents cancerous elements being distributed through the lymph channels during the operative procedure.

This preliminary or preparatory radiation is given with filtration, cross fire anteriorly, laterally and posteriorly; one cycle taking six days, three alternate days for treatment with one day intervening between each treatment. Two weeks from this time the cycle is repeated, ten days after the termination of the second series the patient is ready for the surgeon. Three weeks subsequent to operation, radiation for two series is given as in the preliminary cycle. If any evidence of local or glandular recurrence, the patient should return for further treatment.

Many cases are inoperable when first seen by the practitioner; others become so by delay in applying treatment, and still others from incomplete removal, or because of involvement of the tissues beyond the point of possible recognition by the sense of touch or sight.

What plan of treatment offers most for these unfortunate individuals?

Some patients with extensively ulcerated carcinoma may be made more comfortable and obtain relief from the foul discharge, and sometimes from the pain by palliative yet extensive removal; still others will receive some benefit from massive doses of x-rays; others will obtain relief of pain and increased comfort by the proper application of radium.

It may be necessary in this class of cases to place radium points directly within the neoplasm.

Finally there is the employment of morphia to relieve pain. This is one class of patients where the entire profession recognizes the necessity for opiates.

Some members of the profession seem inclined to the view that the time is approaching when the main dependence in the treatment of breast cancers will be some form of radiation. The number of men holding this view is small, and I am sure the weight of professional opinion is that the radical surgical removal will show the greatest percentage of cures. While the end results are by no means satisfactory, yet the percentage of cures is undoubtedly increasing, and the lapse of time before recurrence is being prolonged.

Before closing, let me again urge each of you to inform the public of the serious nature of mammary growths, and of the possi-

bility of cure if treatment is applied in the early stages.

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MALIGNANCY OF THE UTERUS.*

By LOUIS FRANK, Louisville.

In a pamphlet, issued by the American Society for the Control of Cancer, is found the statement that during the two and a half years in which we took part in the Great War, eighty thousand soldiers were killed or died of disease; and during the same period here at home one hundred and eighty thousand died of cancer, much of which represents a needless and useless waste of human life.

In continental United States the death-rate from all varieties of cancer is estimated for the year of 1920 by the Bureau of Vital Statistics at ninety thousand. It is quite probable that more complete returns, more accurate in character, would have brought the number to one hundred thousand. The mortality rate for cancer in the United States is eighty-five per one hundred thousand, ranking with kidney disease, tuberculosis and pneumonia as one of the five or six diseases (second only to heart disease) as a cause of death.

That cancer is increasing there can be no question, and this is not explained except in small part by our better kept statistical returns. This increase is approximately 2.5 per cent annually. Of the total number of deaths from cancer, those involving the female generative organs, if we include the accessory organs—the mammary glands—account for proportionately by far the greater number, as in this group is included only about fifty per per cent of the population.

Including both sexes we find the greatest number of cancers occur in the stomach (including the liver), viz., thirty-five thousand; the female organs of generation account for thirteen thousand; the breast for eight thousand five hundred; the mouth and tongue thirty-five hundred; the peritoneum including small and large intestine and rectum twelve thousand; the skin three thousand five hundred, and other organs fourteen thousand five hundred.

*Read before the Kentucky State Medical Association, Louisville, September 19, 20, 21, 22, 1921.

CANCER IN CONTINENTAL U. S.

Annual increase approximately 2.5%
Distribution by organs:

Stomach (Both Sexes) (Liver)	35000	
Female generative organs	13000	
Breasts (female)	8500	{ 21500
Mouth and Tongue	3500	
Peritoneum (Intestines and Rectum)	12000	
Skin	3500	
Other Organs	14500	
	90,000	

January 1 to July 31, 1921

Malignancy	Cervix Uterus	15	{ Women 32
	Body Uterus	4	
	Breast	13	
Malignancy	Stomach (Liver) Intes-		{ 20—Women 13, Men 7
	tines and Rectum		
Malignancy	Skin	7	{ Women 5, Men 26
	Lip, Mouth	8	
	Antrum Tonsil	4	
	Glandular	1	
	Prostate	2	
Total			Women 50, Men 33

In a six months survey of our clinic in one private hospital, including the work of our associates, from January 1st. to July 31st. of this year, there were twelve hundred and ninety-nine admissions, thirty-one of which were readmissions, thus giving the net new patients admitted as twelve hundred and sixty-eight. Of this number eighty-three were admitted for malignancy, six of which were sarcoma, seventy-seven some form of cancer. Of these, fifty were in women and thirty-three in men. In thirty-two females there was involvement of the uterus in nineteen, of the breast in thirteen. There were twenty cases of cancer of the intestines, stomach, rectum and liver, thirteen of which occurred in women and seven in men. Another group of five women and twenty-one men showed six with cancer of the cheek, six of the lip, three of the nose, three of the eyelid, one of the antrum, two of the mouth, two of the tonsil, one of the throat, one of the neck, and one of the chest wall. Of five men with cancer, the hand was involved in one, the prostate gland in two, the heel in one, and the inguinal glands in one. Forty-seven of these patients were under our own personal supervision. So we see that cancer is relatively more frequent in women than in men, and this must be accounted for by the great frequency of its occurrence in the genital organs and breast.

CANCER

Relative frequency according to sex and age:

Women over 40 years	1 in 8 succumb
Men over 40 years	1 in 13 succumb
35 to 45 years causes death in 3 women to 1 man	
45 to 55 years causes death in 2 women to 1 man	

January 1 to July 31, 1921.

Admissions (new)	1268
Admissions for malignancy	83
Carcinoma	77
Sarcoma	6
Percentage malignancy	6.54%
Women	50
Men	33
Total	83

Further study shows that beyond the age of forty, one women in every eight is fatally attacked with the disease, while in men one in every thirteen dies of cancer. Between the ages of thirty-five and forty-five three times as many women as men die of the disease, and in the decade from forty-five to fifty-five twice as many women as men succumb.

While the white race, from a statistical standpoint, seems far more frequently attacked by cancer, our own individual experience covering a period of over thirty years of service in the wards of our city hospital with the beds equally divided between the white and black races, does not coincide with this as we have found the disease almost as frequent in the negro. I refer now particularly to cancer of the genital organs.

Our observation has also been that cancer of the cervix is a disease almost exclusively of the married, consequently of the child-bearing woman. Cancer of the body of the uterus we have seen just as often in the unmarried. Most of these women are the mothers of several children. We have recorded four cases of cancer of the cervix following at variable periods of six months to twenty years after supravaginal hysterectomy for fibromyoma. We have observed one case of cervical cancer in which the husband developed carcinoma of the glans penis. We are positively of the opinion, however, notwithstanding the recent statement of Ochsner that he had isolated the germ of cancer and the arguments in favor of his hypothesis, that cancer is neither contagious nor hereditary, nor do we believe in cancer houses or cancer villages. All of these things are susceptible of quite satisfactory explanations upon other hypotheses. There is no question of doubt, however, that childbirth injuries and stimulation of the breasts by lactation and menstruation, account in large measure for the frequency with which the breast and organs under discussion are attacked.

Our first concern, therefore, would be to treat those with such injuries in the precancerous stage, and thus prevent development of the disease. This would consist of the repair of all indurated or eroded cervical lacerations, the excision of all inverted and indurated scars, and the amputation of all chronically eroded and hypertrophied cervixes. We believe if all women presenting any of these so-called precancerous lesions were treated as indicated, or could be kept constantly under observation, very few cervical carcinomata would occur and fewer lives be lost from this horrible disease. Further, all tissues removed at such operations and all curettings should be subjected to histological examination by a

competent pathologist. There are those who believe when we are able to diagnose cancer of the cervix without the microscope that it has passed beyond the period of relief by radical surgical procedure. We do not exactly agree with this opinion, but one must be impressed by the tremendous number of ultimate deaths following surgery if even one competent surgeon of experience give utterance to such expressions.

It would behoove us, then, to study the very earliest symptoms of the disease. The classical text-book signs,—the great cancer triad,—hemorrhage, discharge and pain, are terminal symptoms; and if we wait the appearance of such, then certainly the case has entered the borderline stage of not only curability but operability, and most frequently has become utterly hopeless from any standpoint.

Lynch believes, from the mass of material as he sees it, that the profession is doing little to improve the cancer situation, and that in the hands of men doing surgery the disease is quite as hopeless as it was years ago. He thinks cancer of the cervix is the great problem. Samuel also sorrowfully holds the profession to blame for the hopeless inoperable cases as we see them, and says that eighty per cent of the patients as they come to him are utterly hopeless because of metastasis, the parametrium and the iliac glands being involved when he first sees them.

We believe that propaganda, such as Mr. Bok published in the *Ladies Home Journal* and has also appeared in the *Delineator*, should be continued with especial attention directed not only to the breast but to the uterus. Physicians and also laymen should be taught that a watery vaginal discharge is of significance, that intermenstrual bleeding no matter how slight, particularly in women of thirty-five or over, should also be viewed with suspicion. Bleeding following coitus in a woman beyond thirty-five should demand immediate examination, careful study and observation. The slightest irregularity in the menstrual flow or the least recurrence after the menopause should be viewed with alarm. It is the physician's duty to examine for the source of the bleeding or discharge. If it is from the cervix, the uterus or from an erosion which bleeds ever so little upon manipulation or examination, a microscopic study should be made. Copious hemorrhage means ulceration, odorous discharge means sloughing, pain indicates extension of the disease outside the uterus with nerve pressure by the growth, the sum total of which indicates, as has been said before, that the disease has entered its terminal stages and little if anything can be promised the patient.

Agreeing with Clark, then, we group our

cases into three classes: (a) the early or very beginning cases; (b) the borderline cases, i. e., patients who have delayed seeking relief for from three to five months since the symptoms first began, and (c) the third group represents patients who have pain, odor and hemorrhage, who have had discharge for a year or more and belong to the late or hopeless class.

For many years past, and particularly since perfection of the Wertheim operation, the propaganda for early operation for cancer of the cervix has been a most active one, as has been that of cancer all along the line. If the results of this propaganda are to be measured by the operability of the patients who come to us with uterine carcinoma, we must admit that it has not been altogether a brilliant success. Much has yet to be done to educate both the laity and the profession at large to heed the earlier manifestations of this and other malignant diseases.

Our own surgical experience caused us about five years ago to turn to radium in the treatment of cancer of the cervix. In the group of cases we will present none treated within the past year is listed. During this period of four years we have treated seventy-one patients with cancer of the cervix and three of the uterine body. We have arrived at some very definite conclusions and our opinion as to the value of radium as compared to radical operation in the treatment of cervical cancer is decidedly favorable to its use both in late and early cases; this in face of the fact that our work is entirely surgical and our viewpoint biased and tinged by our surgical inclinations.

For us the value of radium is no longer conjectural or speculative. As a palliative remedy its usefulness is beyond the peradventure of a doubt, and we are firmly convinced that as a curative agent in cervical cancer, if we are to consider the five year period as an expression of cure, it has established a position not only equal to but even surpassing that to be obtained by operative means. We say this advisedly recognizing full well some of the brilliant results at present secured by radical surgery in early operable cases.

In this discussion, and to understand fully the often wonderful effects of this element, we divide our cases into three groups:

- (1) The early or distinctly operable cases;
- (2) The borderline (mostly inoperable) cases;
- (3) The late cases which have undoubted and evident local extension often with metastatic and general involvement.

Every one of our cases has been verified microscopically and the pathological type of the growth has been studied in each, but as

our studies in this direction have not yet been fully completed we are necessarily not prepared at this time to discuss that side of the topic as bearing upon the value of radium. Suffice it to say, however, that with other observers we have noted basal cell growths slow to metastasize and yielding readily when seen easily to both operation and radium.

Early cases: These are the only ones in which today there may be some difference of opinion as to the best plan of treatment to be followed. Tussig's series showed no operative mortality, and Kelly operated twenty consecutively without a death. Graves' series of one hundred and fourteen early cases showed a primary mortality of 5.2 per cent, ninety nine of his patients being subjected to the Wertheim operation. When we study the five year cures in these early cases we find in Graves' series 16.8 to 18.5 per cent of absolute cures and 27.6 to 34.2 per cent of relative cures. Bumm's statistics of January, 1919, quoted by Tussig show two hundred and three cases operated in 1911 to 1913 with five year cures in seventy-seven or 37 per cent. In 1913-14 he also treated seventy-seven cases with radium, seventeen or 22 per cent remaining cured for five years. Not having analyzed these cases personally I assume they were all of the operable group.

From a study of these figures one is seemingly forced to the conclusion that in the hands of the highly skilled early operation presents the best chance of five years cure and attended by a fairly low mortality. I am inclined to the view, however, that generally speaking the Wertheim operation is attended not only by a much higher primary mortality, but certainly with a much lower percentage of five year cures. For my own part, prior to using radium, our own five year cures did not nearly approach such figures.

It is probably true, as Taylor says, that operability formerly led to operation when the chance of cure was slight and the operative risk great; today many of these patients are treated with radium which has also made a new group of cases in that it makes them operable. Two such are reported in our own series. Incidentally we may say here that Taylor believes even the operated cases should have radium treatment as offering the best chance, and in his experience nothing has produced the favorable results in inoperable cases as has radium.

Lynch states that early growths are best removed by wide or extended operation, and that nothing treats so successfully as radium those cases in which extended surgical removal is not permitted. This is also the expressed opinion of Burnam, Graves, Miller (New Orleans) and John G. Clark, though in

the latter's mind there seems some doubt as he further says in his discussion last year at the meeting of the American Association of Gynecologists: "With the use of radium the operative indications will steadily diminish." Personally, we not only agree with this latter opinion, but would say that the time has come to treat all cases of cancer of the cervix, no matter how early, not by surgical operation but with radium. Hysterectomy has no longer a place in the treatment of cervical cancer, but if operation should be elected it must not only be done very early but must be of the radical and most extended kind just as we are doing for carcinoma of the breast.

Our group of cases includes twelve of the early and distinctly operable type. Six of these were operated by the Wertheim method combined with radium. Three of the patients are living and completely well after four years, one after three years, one after two years, and one after one year. The other six in this group were treated with radium alone. Three are alive and completely well after three to four years, and three after two to three years. One of these patients we have seen within the last few days. In addition to these twelve patients, three others were observed which might probably have been successfully operated, but they were classified as borderline and subjected to radium. All are alive and well after more than two years.

The interpretation of the dividing line of the early or distinctly operable and the borderline type will vary with the individual. We have classified as early those in which the uterus was freely movable, without vaginal (especially anterior vaginal) involvement and without the least fixation of the uterus; in fact the disease still being local.

Borderline cases: In this class we believe that beyond question radiation is the treatment of choice, for it is the radical operation in this type that has resulted in not only the high mortality primarily, but in the very few permanent cures. It has oftentimes befallen our lot to begin such an operation in the belief that radical removal was feasible, only to find the invasion so extensive that cure was absolutely out of the question.

Unquestionably in fairly extensive local involvement radium yields the best results. Even bladder fistula which may follow is preferable to cancer death and affords an opportunity for later repair. Just how many of such cases are in our series we cannot say, for having arrived at the conviction that such cases had best be radiated, they have all been grouped among the late type. None of them were cauterized nor curetted, as we are convinced, curettage is not a procedure ever to be applied in malignancy for very obvious

reasons. The vast majority of cases, as we see them, are definitely in Group Three.

Distinctly and undoubtedly late cases with extensive local involvement or metastases more or less widespread are clearly inoperable. Heretofore this entire group has either been abandoned surgically or subjected to cauterization and curette, often to the disadvantage of the patient, and followed always by rapid return of foul discharge and bleeding, never in any event prolonging the patient's life or rendering her in the least more comfortable. In such cases even the most ardent advocates of early radical removal concede radium the first place in the treatment. Kelly and Burnam have thirty-five such, either late or extensive borderline cases, the patients now being alive and well after five years. Although we have no patients living after such a period, there are five living and apparently well after more than two years.

Our practice has been to examine all these patients most carefully per rectum for broad ligament and glandular involvement, the same method being pursued in the early cases even in the absence of the least apparent degree of fixation. Examination per rectum yields much more information as to deep extension than does either simple vaginal or bimanual investigation. Our own observation in these late as well as in the early cases has served to forcibly impress Burnam's statement that "the possibilities of treatment by radium extend from the very beginning of the disease to the last stages of cervical cancer." Even so, neither the profession nor the laity must expect too much especially in the late cases; the impossible cannot be achieved notwithstanding the almost miraculous results seen repeatedly by those engaged in this work. Did time permit a number of apparently hopeless cases could be detailed, the patients to all appearances being well with complete local healing after from one to four years.

We have observed where the growth was apparently healed and later returned, that it can rarely, if ever, be checked, no matter how treated. This agrees with the experience of Heyman, Taussig and Janeway. Again, we have had individuals in which the treatment seemed to stimulate the growth, causing rapid increase in its progress. Whether this is due to fault of technique, dosage, or type of growth, we cannot say. In practically all of our cases, however, there has been an immediate local improvement with amelioration of all symptoms and disappearance of bleeding, foul discharge and pain. In none has pain been increased as some observers seem to note. Usually local healing has occurred even in those later dying, the exit being due to internal metastases rather than the local process.

Septic absorption from local ulceration has been ended and the cachectic look resulting therefrom has often been banished. We feel that many of these unfortunates have had their lives prolonged, giving up their morphine, and, to them, as frequently expressed, "it has been worth while."

We have refused treatment to only eight, ten or possibly twelve patients, the local process in all being so extensive that improvement even could hardly be anticipated. We believe in justice to those who seek radium treatment, it is better to reject these very late and hopeless cases, otherwise the failure of improvement may act as a deterrent to many who, beyond operative relief, might yet be vastly improved or even cured with radium. We must, however, be honest and in no instance promise too much to any of these individuals, even though the disease may seem in a most favorable stage. We have never promised, nor do we ever speak of a cure, yet we are convinced that the statements of Clark, that the results from radium treatment approach closely the operative results is too modest an expression, and that when the accumulated cases have been studied the results ultimately will be found to surpass those following operation.

Excluding the few rejected cases our experience is shown in the following tables:

RADIUM TREATMENT

Carcinoma of Cervix.	
Total cases treated to December, 1920	71
Dead	35
Living	36
Carcinoma of Corpus.	
Living over three years	1
Living over four years	2
	3

Carcinoma of Cervix.—Radium.

Died six to twelve months after treatment	26
Not heard from, supposedly dead	2
	28
Died twelve to eighteen months after treatment	3
Died eighteen to twenty-four months after treatment of internal metastasis (local healing)	1
Will die shortly	2
Local healing, panhysterectomy fifteen months after treatment, no trace of disease, injured ureter, attempted repair, death	1
	35

Carcinoma of Cervix.—Radium.

Living	31
More than four years after panhysterectomy followed by radium	3
More than three years after panhysterectomy followed by radium	1
More than eight months after panhysterectomy followed by radium	2
More than two years after radium treatment followed within three months by panhysterectomy	1
	38
Less two living, both of whom will die shortly, and already counted among those dead	2
	36

Carcinoma of Cervix—Radium.

Living six to twelve months after treatment	7
Twelve to eighteen months after treatment	6
(Apparently well).	
Eighteen to twenty-four months after treatment	5
(All of these very serious; one in cervix after supra vaginal hysterectomy).	
Twenty-four to thirty-six months after treatment	8
(Three were early cases of adenocarcinoma).	
Thirty-six to forty-eight months after treatment	5
(Three were early cases).	

—
31INOPERABLE CASES CANCER OF UTERUS
(CLARK AND KEEFE)

	No case treated within one year before report.	Dead	Not traced	Living
1914	8	0		1
1915	19	1		4
1916	46	8		11
1917	33	3		23
1918	5	13		34
Total	111	25		73

CONCLUSIONS.

(1) In early carcinoma of the cervix in the hands of the best operators, although radical operation continues a justifiable procedure, equally as good if not better results, considering the primary mortality, are obtained by radium treatment:

(2) All borderline cases should be treated with radium:

(3) Late cases may be improved and palliated by radium as by no other means at our command:

(4) If the five year period of curability is to be accepted as indicating a cure, then the results of radium treatment surpass by far those obtained by the profession at large in the treatment of cancer of the cervix by surgical means:

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Treatment of Fistulas of Dental Origin.—Despin warns to suspect a dental origin even with a fistula under the jaw toward the neck. A glandular process has been assumed in three cases of the kind, but eurenting the fistula had had no effect. He then forced hydrogen dioxide of 100 volumes into the pulp cavity of the suspected tooth, and forced it through the tooth. It made its way out through the fistula; a saturated solution of phenic acid followed, and in a week the fistula had healed.

TREATMENT OF MALIGNANT UTERINE
CONDITIONS WITH RADIUM.*

By WOOLFOLK BARROW, Lexington.

When Dr. McCormack invited me to read this paper I felt great hesitancy in accepting. I still feel uncertain whether I should have accepted. In the first place, I am in no sense a radiologist, as I limit my work to surgery. In the second place my experience with radium has not extended over a time sufficiently long to prove the end results in those cases that I have treated. However, my experience has been sufficient to impress certain conclusions upon me which I will mention later.

Statistics compiled by the American Society for the Control of Cancer, show that 11,965 women died of cancer of the uterus in 1918. Cancer in all its forms accounted for approximately 70 deaths per 100,000 population during 1920. A further statistical study shows that cancer mortality is gradually on the increase.

The essential factor in the cancer campaign is a realization by both the layman and the doctor that cancer in the beginning is a local disease and is curable if removed while local. Therefore, every effort should be directed toward early diagnosis. This is especially essential in cancer of the cervix. Really there is not much excuse for inoperable cancer of the cervix.

If we as public guardians will go before the public and convince the people of what we know about cancer we will accomplish a great good. This is the main object of the American Society for the Control of Cancer.

Carcinoma of the cervix, according to Wertheim's conclusions, is twenty times more frequent than carcinoma of the fundus. In this paper I wish to discuss principally the former, as my paper deals principally with radium treatment which I believe is not the method of choice in cancer of the fundus. Accepting the usual classification of cervical carcinomata into operable and inoperable, I find that approximately 35 per cent of the cases examined belong to the first class. In other words, practically 65 of every 100 women suffering from cancer of the cervix are inoperable when first seen by the surgeon. Of the 35 per cent that are operable, there is an operative mortality of approximately 18 per cent when the Wertheim operation is performed. The treatment of the inoperable class is, or should be, in my opinion, outside the surgical domain.

My personal observation of the action of radium has been limited to patients referred

*Read before the Kentucky State Medical Association, Louisville, September 19, 20, 21, 22, 1921.

to me during the last five months. The total number of patients treated was 13. The youngest patient was 27 years of age. Oldest 77 years. Twelve married, one single. All twelve married women had borne children. The average time between onset of symptoms and time of radium application was 7.6 months. Without exception the principal symptom was abnormal bleeding. The bleeding was slight in some cases, but bleeding between periods or after the menopause was present in all. Pain was present in only three cases. Severe in only one. The earliest onset of pain was one week after abnormal bleeding was recognized. In one case pain did not occur until two years and three months after the onset of hemorrhage. In every instance except two, the patient attributed the abnormal bleeding to menopause. One of the exceptions was the twenty-seven year old patient whose diagnosis was made within a few weeks of the onset of symptoms. I believe a few remarks concerning this case will be interesting.

As I before mentioned, this patient was 27 years of age, unmarried, had never been pregnant, and had never had any dilation or instrumentation in her uterus. She had some irritation with a slight bloody discharge from the vagina. She immediately consulted her physician, who found a somewhat enlarged, reddened, apparently inflamed cervix, which he treated by silver nitrate applications and douches. Upon failing to relieve the condition he took a small section from the cervix and had it examined in Cincinnati. The section revealed a scirrhus carcinoma. I was then called into the case and upon examination was very dubious as to the correctness of the diagnosis. I sent the patient to the hospital for radium application, provided a frozen section confirmed the diagnosis of cancer. This frozen section, taken under gas-oxygen anesthesia, confirmed the diagnosis, so radium was applied immediately.

The other exception was that of the oldest patient, 77 years, who had passed the menopause 20 years previously. This patient had been bleeding irregularly for three years. She had no pain until two years and three months after the onset of abnormal bleeding. Although she had passed the climacteric twenty years previously, her physician made no pelvic examination except once during the three years she was under his care. A still more glaring example of failure to examine was in a woman 49 years of age, who had had excessive metrorrhagia for fourteen months. This patient was so weak and anaemic that she could hardly walk. She had since the onset of vaginal bleeding four physicians, not one of whom made at any time a pelvic ex-

amination. She was referred to us for x-ray treatment of her goiter.

Method of Application: In my cases, I have followed the plan of Dr. Cameron of the Pittsburgh Chemical Company, of using 100 mg. of radium element; 50 mg. inside the uterus and 50 mg. across the cervix, thereby obtaining a maximum dosage by cross-firing. The radium enclosed in a glass tube which in turn is sealed in a silver capsule is applied by screening in a brass screen which is then enclosed in rubber tubing. The radium is held in position by gauze packing in the vagina. A large amount of this gauze is used as it not only holds the radium in position but it also pushes away the bladder and rectum, which is necessary in preventing a burn of these structures.

The time of application depends on the extent, depth, and characteristics of the cancer. Twenty-four hours is the usual length of application. In one case I used twenty-five mg. within the cervix and twenty-five across the cervix at the first application, and I buried four 12½ needles within the cervix for the second application. The smaller dose was used because of the small size of the cervix which did not separate the radium from the bladder and rectum sufficiently to afford safety from a burn.

Results: As I before stated, sufficient time has not elapsed since the treatment of my cases to prove the end results.

As to the Primary Results: Nausea and vomiting occurred in four patients while the radium was in utero. In three of this four, these symptoms ceased immediately upon the withdrawal of the radium. In the other, there was cessation within 24 hours upon the free administration of soda by mouth. There was some rectal irritability in two cases, though not severe enough to require special treatment. Bladder irritability in three cases. In two cases alkaline irrigations and sedatives were necessary. In one of these cases the irritability did not appear until eight weeks after application. It persisted for two weeks. In five cases there was no secondary reaction. In the others there was some secondary reaction which was evidenced by an elevation of temperature, an increased pulse rate, and abdominal pain. The highest temperature was 102¼ and the lowest 99. Eight days was the longest duration of elevated temperature. Abdominal pain was present as a secondary reaction in four cases. Very mild and of practically no consequence except in one case who had rather severe pain in the region of the Fallopian tubes. In this patient pain was not so severe as to require an opiate.

Hemorrhage was checked in all cases within a short time after application. Discharge was diminished in all cases except one, in which it was apparently increased. Pain was aggravated in one case, and somewhat lessened in these others who had pain. The general condition as regards feeling and strength was improved in every case except one who died three months after application. There were no rectal or vaginal fistulas. Vaginal examination showed improvement in local condition after a subsidence of the temporary inflammatory local reaction.

Since the number of cases treated by me is small, I wish to borrow from literature the results of others who have had more experience. In table 2 of the paper read by Drs. John G. Clark and Floyd E. Keene, of Philadelphia, before the A. M. A., in Boston in 1921, hemorrhage was completely relieved in 51 of 66 cases. Temporarily relieved in 4; not stated in 2; not traced in 9; no effect in none; leucorrhea completely relieved in 37 of 66 cases; pain relieved in 21; unrelieved in 3; pain caused by radium in 3; not present in 30; bladder irritability in 4; rectal irritability in 2; fistulae, 6; local healing, 42.

I wish to say only a few words as to the actual technique of radium application. All patients are prepared for gas-oxygen anaesthesia. Twenty minutes before anaesthesia they are given Morph. Sulph. gr. 1-8, Atropine Sulph. gr. 1-150 hypodermically. An enema is given the night before and the morning of the operation. The bladder is catheterized immediately before the patient is brought to the operating room. The radium is introduced into the cervix with as little trauma as possible. When the cancer is of the cauliflower type some of the friable tissue is removed, care being taken not to traumatize the base of the cancer. After the radium is placed in position the vagina is firmly packed with gauze. While the radium is in situ the bladder is catheterized every four hours; the patient's knees are fastened together and sufficient morphine is given to keep the patient quiet.

As to the question of radium versus operation: No argument can be raised in the cases in which the cancer has spread beyond the uterus either by direct extension or by metastasis. Radium is the method of choice in these cases. When the cancer is confined to the cervix the question is debatable. I believe the majority of our best surgeons hold to the opinion that operation is the method of choice. However, it seems to me that the opinion that radium is indicated in this type of case is gradually gaining headway. Some of our most prominent are now advocating

the use of radium followed in a few days by operation. My own opinion, based principally upon what I have read plus my own personal use of radium, is that radium is the method of choice in every case of cancer of the cervix regardless of the extent of the cancer. My opinion is based upon the high mortality following operation, the impossibility of being certain that the cancer, even though apparently localized in the cervix, has not metastasized, and the fact that the percentage of five-year cures is higher following radium application than by radical surgery.

THE NECESSITY FOR THE EARLY RECOGNITION OF CANCER OF THE GASTRO-INTESTINAL TRACT.*

By JOHN H. BLACKBURN, Bowling Green.

In practically all studies of the general subject of cancer in recent years there is noted a definite increase in the occurrence of the disease. This increase seems to be general in its distribution and not limited to any particular locality. Improvement in methods of diagnosis and treatment, the enlargement of areas of registration with increased and improved vital statistics and the increasing span of life which carries more people into the cancer age are all given as reasons for the increase in the incidence of cancer, but after all these factors are given due value there is apparently a definite increase in the number of cases of cancer each decade.

The most recent investigations indicate that one woman in every eight and one man in every eleven beyond the age of 35 years dies of cancer. The statement has recently been made that cancer of the rectum and colon has increased 100% within the last 15 years.—Lynch.

Bloodgood has stated that in the life-history of every malignant growth there is a time when it is surgically curable, this of course being in the very early stages before metastasis occurs. The ancients recognized that the growth must be destroyed by caustics, etc., and then allowed to separate itself from the body. With the development of surgery came the improved technique in the removal of all malignant growths and at this time no one will deny that the proper treatment in every case is the surgical removal of the tumor if recognized sufficiently early in its life-history. With the extension of any tumor by metastasis or continuity the treatment at any stage consists in the removal of

*Read before the Kentucky State Medical Association, Louisville, September 19, 20, 21, 22, 1921.

the original growth with any and all affected parts. Every malignant growth if untreated or improperly treated will soon reach the so-called inoperable stage, which means neglect on the part of the patient or his medical advisor.

At every period in the history of medicine some remedy used by internal administration has been offered as a cure for cancer but thus far no medicinal treatment has been found effective. No one denies the place occupied today by radium and other forms of radiant energy in the treatment of cancer in its different forms and locations, and yet its most ardent advocates insist on the early recognition of the existence of a malignant growth and on its complete removal by surgical means if possible.

In the surgery of the gastro-intestinal tract the technic of the removal of malignant growths has reached a remarkable degree of development, leaving little to be desired if the patient has not already passed into the late hopeless stage of the disease. If any material improvement is to be made in our treatment of these conditions and if we are to cure them rather than prolong life for a few weeks or months, it must come from an earlier recognition of the possible or probable existence of the disease rather than from an improvement in surgical technic.

The most intensive study of these conditions and the most marked advances have been made almost without exception at the hands of the surgeons. Practically all of the cases are seen first by the general practitioner and it is he whose attention must be called to the early and suspicious symptoms, and it is only by the man in general practice, the internist and the surgeon working together that any real good may be accomplished. Unless these cases are referred on suspicion to a clinic where a complete examination by the X-ray, gastric analysis, etc., can be done, most of them will pass into the unmistakable, hopeless condition of anaemia, cachexia, tumor, anacidity, etc.

In a study of this subject some years ago we had occasion to consult some seven textbooks on the practice of medicine and no one of them gave a symptomatology that could be recognized until the patient was in a hopeless inoperable state. A majority of our general practitioners depend on the texts on practice rather than on the surgical literature and for this reason their attention is not drawn to the necessity and opportunities for a more thorough study of these cases in their early stages. It is a rather hopeful sign that the following is to be found in one of the most recent systems of medicine: "In this country to-day we are hampered with text-book descriptions

and clinical pictures which represent the advanced disease, and advanced disease is equivalent to a death warrant."—Rehfuß.

As an indication of the importance of cancer in the digestive tract, Mayo states that 30% of the cancers in civilized man are found in the stomach. The number occurring in the small intestine is small, but a relatively much larger number are found in the large intestine. As factors leading to the development of malignancy in the stomach and large intestine rather than the small are mentioned hot foods and the acid state of the contents of the digestive tube in these locations, both of these factors bearing a relation as chronic irritants which alter the circulation. Age has been always considered a factor in the causation of cancer and we are rather prone to consider it a disease of old age, placing most of the cases beyond 55 or 60 years, when in fact many cases are reported between 35 and 50 years of age. This applies to cancer of the stomach and large intestine as well as in other locations in the body.

CANCER OF THE STOMACH.

Moyuihan has emphasized the value of the clinical history in the diagnosis of cancer of the stomach and suggests that the cases coming to operation usually present one of three types: (a) Cases, generally acute, in which there can be obtained no history whatever of any gastric disorder, but in which not infrequently a severe haematemesis is the first symptom. These cases usually run a very rapid course, terminating fatally in four to nine months. Smithies in a clinical study of 921 cases of operatively demonstrated gastric carcinoma found 31.9% of this type. (b) Cases in which there is a history, usually, of repeated attacks, occasionally of one ancient attack, of indigestion which is undoubtedly due to the presence of a chronic ulcer of the stomach. Smithies series showed 55% of the cases with a history of stomach disorder of the ulcer type. There are still some who question the relationship between carcinoma and old ulcer of the stomach, but the evidence is increasing year by year which seems to establish it beyond question in a larger number of cases. (c) The third group consists of a certain percentage of cases, about 10% according to Smithies, in which there is an atypical history resembling any one of the functional gastric disorders, but in a patient 40 to 50 years of age there develops a so-called stomach disorder, which does not yield to ordinary treatment, but with indefinite pain, occasional vomiting, loss of appetite, gradual loss of flesh, increasing anaemia and exhaustion, it is realized he has a serious disease.

In no condition is it more essential that a

carefully developed and studied clinical history be made than in these ill-defined, suspicious gastric disorders in patients past 45 years of age. While over half the cases of cancer of the stomach may be suspected from the clinical history, there remain the others in which nothing directly referable to the stomach may be found, and it is to this particular group that due attention should be given. In any case in which a definite cause cannot be found for the anorexia, the distaste for certain foods, the gradual loss in weight, the increasing exhaustion and anaemia, with a gradually developing cachexia, immediately every diagnostic means should be used to determine the possible existence of a malignant involvement of the stomach.

In arriving at a diagnosis three methods of examination are available: (1) Physical examination: This should be done in a good light and with the chest and abdomen fully exposed. This should be performed with the idea of seeing and feeling more than a tumor in the epigastrium, for if the tumor is already present it means a fairly well advanced condition. Certainly a complete physical examination should be made. (2) Gastric analysis: This should in every suspicious case be made at intervals for comparison, for every case of anacidity of the later stages was at one time a case of subacidity with a gradual decrease in the amount of free HCl. The analysis should include both the interdigestive and the digestive phases of the stomach functions, thus determining the evacuation time of the stomach, the secretory curve of digestion with the presence of ferments, as well as the presence of pathological products, pus, blood, mucus, organic acids and bacteria. (3) X-ray examinations: This method of examination shows only the presence of a tumor in the stomach, but in view of the fact that 95% of the gastric tumors are malignant its importance as a diagnostic aid may be appreciated. According to Carman the variations from the normal in their order of importance are (1) filling defects, (2) Alterations of pyloric function, (3) perversion of peristalsis, (4) altered motility, (5) lessened flexibility and mobility, (6) alterations of size.

In every case under consideration, the history, the physical examination, the gastric analysis and the X-ray examination will vary with and be influenced by the location of the tumor in the stomach. This is particularly true if it be near the pylorus and produces the manifestations of early obstruction.

Again we would insist that in every suspicious case the complete gastric analysis and an exact x-ray examination should be made, fluoroscopically and radiographically and if these means are not available it is our duty to

refer the cases to a completely equipped clinic in which they may be properly carried out.

CANCER OF THE INTESTINES

Cancer of the small intestine is relatively rare, occurring most frequently in the ileum and very rarely in the duodenum. In the large intestine it is found most frequently in the rectum, next in the sigmoid and the other portions of the colon. The symptoms are local and general. When located in the sigmoid and rectum the early symptoms are usually pain, colics, alternating constipation and diarrhoea, with later the evidence of beginning obstruction and the appearance of exhaustion, anaemia and loss of flesh. Any disorder of this type should lead at once to a digital examination and if nothing is found in the rectum, by the finger, the proctoscope or sigmoidoscope should be used. Any malignant growth in the sigmoid or rectum may be rather accurately outlined by the use of the X-ray.

Briefly may we reiterate that cancer is increasing, that surgical technique has developed far in advance of diagnosis in these conditions and that the man who is seeing these cases first must always be suspicious and be willing to refer cases on suspicion. No one advocates a useless or unnecessary exploratory laparotomy, but when the surgeon has exhausted all diagnostic means and has a well-founded suspicion he should then open the abdomen, for the actual inspection of the parts is the most positive means of determining the presence of malignancy and the proper removal of the tumor offers the only hope of a permanent relief. May we quote from Moynihan: "The position seems now to be this, that there are no signs or symptoms clearly indicative of the presence of gastric cancer; there is no refinement of clinical inquiry nor any endowment of clinical acumen which will enable a confident diagnosis to be made in an early stage; inspection of the stomach during an operation carried out when definite faults in its working are known will permit of the early discovery, or of the prevention of the certain proportion of the cases of cancer. The surgeon must not ask the physician for a sign which will reveal the presence of this disease to him, but he can and should require that these conditions which are only to be remedied by operative measures should be referred to him not in their advanced or terminal stages, but at the earliest moment of their recognition. The success which has followed the surgical treatment of gastric disorders justifies this simple request."

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MALIGNANCY OF THE RECTUM.*

By BERNARD ASMAN, Louisville.

Not many years ago one of the most prominent surgeons in America (McGuire) made the following pessimistic statement: "Cancer has been a constant subject of study in all ages and in all nations, but the mystery of its origin has yet been unsolved, resistance to its progress has yet proven unsuccessful, and the symbolic crab continues to sink its claws slowly but relentlessly into the flesh of its victim. The disease, at first local, becomes regional and constitutional; recurring when removed, disseminating when left; undergoing degeneration, intractable ulceration, deep-spreading excavation, and is usually followed by cachexia and death."

Not long thereafter an editorial writer declared: "It must be confessed that in spite of the time, brains, energy and money which have been expended during the past few years in the attempt to solve the problem of cancer in almost all parts of the civilized world, little or no apparent progress has been made."

While it is regretfully admitted, little is yet definitely known concerning the etiology of malignant disease, the pessimistic attitude of these older observers with respect to its management is being gradually replaced by a feeling of greater optimism based upon the end-results of radical surgery; and especially is this true in regard to malignancy of the rectum.

There can be no reasonable doubt that the incidence of malignancy is markedly increasing throughout the civilized world, thus verifying the predictions of Dennis, Park, Tuttle and others made about thirty years ago. It is often stated that "cancer is now killing one out of every ten persons over forty years of age." However, it would be more accurate if this remark were modified or made to apply particularly to untreated malignancy or instances in which the diagnosis is not perfected until the disease has progressed beyond the operable stage.

Statistics indicate that over fifty per cent of all cancers are found in the gastro-intestinal tract; that the rectum proper is involved in about five per cent of all malignancies, and if to these be added adjacent cancers of the sigmoid flexure, the percentage is increased to about six and one-half. Attention is called to this fact for the reason that malignancies of this region are undoubtedly of more frequent occurrence than is generally believed. Males are more commonly attacked than females in the proportion of nearly two to

one, for which no explicable reason can be assigned. Age limits are unimportant in the development of rectal cancer, cases having been recorded in individuals ranging from thirteen to eighty-four years. However, the greatest number occur in the so-called "cancer age," i. e., between thirty-five and fifty-five.

It is worthy of remark, in this connection, that the increase in the number of cases is especially noticeable in young people. In the cases observed in children, says Tuttle, it has appeared to be not so much a question of age in years as age in tissues. "Where there is a tendency to early retrograde processes in the animal economy, where the patient matures prematurely, carcinoma is likely to develop early in life." Can it be, then, that the modern so-called "strenuous life" offers a possible explanation of the increasing frequency of the development of cancer in early adult life and in children?

The recognition of rectal malignancy in its early stages is not especially difficult provided proper methods of investigation are instituted; but, unfortunately, the diagnosis is frequently delayed because the early symptoms exhibited by the patient are not always suggestive of malignancy, and the family physician who is primarily consulted seldom examines the rectal interior under any circumstances, apparently being content to prescribe for the patient under the self-made diagnosis of "piles." This is a pernicious practice to which attention has been repeatedly called by those familiar with the insidious progress of rectal malignancy.

Let it be reiterated that the early diagnosis of uncomplicated rectal malignancy entails no serious difficulty and can usually be made by the general practitioner provided he will take the trouble to institute requisite methods of investigation. It too often happens that the disease has progressed to an inoperable stage when the patient consults the surgeon.

The gradual development of rectal cancer in individuals who perhaps for years have been victims of other forms of rectal disease, such for instance as bleeding and protruding hemorrhoids, to which the patient has become accustomed, probably accounts for the advanced stage of cancer found in a large percentage of cases, the patient attributing any new subjective symptoms noticed to progress or aggravation of his old trouble. Undoubtedly many cases of rectal cancer are directly due to malignant transformation of previously existing non-malignant disease. Quenu and Hartman state that fifteen per cent of all carcinomas of the rectum are preceded by hemorrhoids, while Davis believes from his

*Read before the Kentucky State Medical Association, Louisville, September 19, 20, 21, 22, 1921.

own experience and observation that thirty-five per cent of patients with cancer of the bowel have been sufferers from hemorrhoids.

When in doubt as to the character of an existing lesion, careful microscopic examination should be made of deep sections taken from growth. Absolute reliance, however, may not be placed upon negative reports because in the early stages of transformation of tissue from benign to malignant, certain portions of the neoplasm may still be benign, while other sections may be markedly malignant. The importance of determining the character of the growth before operation is readily seen. One would not want to do a radical extirpation of the rectum if the lesion were benign, nor would one want to omit radical procedure if malignant.

The clinical symptoms produced by rectal malignancy depend largely upon the type of the neoplasm and its location. Contrary to the prevailing belief, pain is not always a prominent early factor unless the growth involves the lower rectal segment or perianal tissues. In the latter event pain is severe and is noted early because of interference with sphincteric function. Malignancy may exist in the upper rectal segment or sigmoid for a considerable period of time without appreciable effect upon the physical status of the individual, or the production of symptoms sufficient to attract attention of the medical attendant, the patient merely complaining of a vague sensation of discomfort about the pelvis or sacral region especially during defecation. In such cases careful proctosigmoidoscopic investigation will often reveal the presence of early malignancy. Simple digital examination fails to disclose the neoplasm under such circumstances, since it is situated beyond reach of the examining finger. In the lower rectal segment the diagnosis can frequently be made by digital investigation alone, but even then confirmation should be had by careful proctoscopy and microscopic examination of a section of the growth.

Pain, hemorrhage, diarrhea or constipation with the presence of pus or mucus in the dejecta, attended by loss of weight and strength not otherwise readily explained, should suggest careful proctosigmoidoscopic investigation. The important fact must not be forgotten, however, that the co-existence of malignancy with hemorrhoids, polypi, rectal abscess, fistula, mucosal irregularities, local luetic lesions, etc., may sometimes cause temporary diagnostic obscuration.

In order to avoid overlooking incipient malignancy, and to prevent constant dangerous delay in application of proper treatment while the disease is still a local lesion, it is essential that the attendant adopt the absolute rule al-

ways to examine the rectum of every patient who exhibits the slightest evidence or even suspicion of rectal pathology. Perhaps a better rule would be to make rectal investigation a routine part of every general examination.

The treatment of rectal malignancy may be divided into: (a) prophylactic, (b) palliative, and (c) surgical. Prophylaxis consists in the adequate treatment of so-called "pre-cancerous" rectal lesions, hemorrhoids, polypi, abscesses, fistulae, fissures, mucosal irritations, erosions, ulcerations, etc.

Palliation is to be considered only where the disease has progressed to an inoperable stage when observed by the surgeon, or where the physical status of the patient precludes radical surgery. After the disease has extended beyond the operable stage, colostomy is the palliative treatment *par excellence*. The judicious use of opiates, tonics, irrigations, etc., also assist in promoting physical comfort and lessening the burden of an incurable affection.

At present the only hope for clinical cure or even material prolongation of life in rectal cancer is by radical surgical intervention; and the earlier the diagnosis is made and operation undertaken the greater the prospects of securing permanent relief, i.e., if the malignancy be recognized and radically removed while still a local lesion, there seems good reason to hope for non-recurrence.

The application of radium and the roentgen-ray may be of benefit both before and after radical operation in preventing or limiting metastasis and thus reducing the likelihood of recurrence. I am aware of no permanent cures of rectal cancer from the application of these agents alone. It is well to remember, in this connection, that metastasis in rectal cancer usually occurs much later than in malignant disease involving other portions of the body; therefore the chances of successful surgical removal are correspondingly increased.

The disease sometimes apparently extends by contiguity of structure to the urinary bladder, prostate, seminal vesicles, etc., but in the majority of instances the surrounding organs remain free from neoplastic change until late in the course of the disease. It may be surprising to state that the diseased rectum may be intimately adherent to adjacent organs without the latter being involved, yet this is often found to be the case. The most frequent routes of extension are: (a) through the lymphatics, (b) possibly by the blood stream, and (c) by continuity of structure. Malignancy involving the anal region may extend upward by continuity to the rectum and ischio-rectal fossa, or externally to the scrotum, vagina or vulva. Rarely does malignancy of the superperitoneal portion of the rectum extend

by contiguity to the prostate, primary bladder, uterus, etc., prior to development of metastatic glandular involvement. As already intimated metastatic involvement may and often does occur in remote localities late in the disease.

The wisdom of preliminary colostomy in every case of rectal cancer has been well established by surgical experience. Through the opening so made that portion of the rectum to be later removed may be irrigated daily, thus eliminating toxins, overcoming ulceration, reducing inflammation, affording ready exit for fecal accumulations, relieving pain, straining and tenesmus, and promoting comfort of the individual.

As in surgical pathology involving other situations, in dealing with rectal malignancy the greatest interest centers about the method of approach and the operative technique necessary to the successful removal of the neoplasm and maintenance of function. Unfortunately no standardization in the method of surgical procedure seems possible in rectal cancer; even the route of approach must be varied to meet indications, depending upon location of the neoplasm, its stage of development, accessibility, etc. The physical status of the individual and his ability to withstand radical surgery must always be considered.

There are two principal routes of approach both of which have definite indications, viz., (a) the perineal, and (b) the combined or abdominal-perineal. The time-honored but mutilating method of Kraske has rightly been abandoned or greatly modified by modern surgeons. I have never yet encountered a case where removal of the coccyx and portion of the sacrum became necessary during resection or amputation of the rectum.

Speaking from a general standpoint, recognizing that there may be exceptions, it may be stated that where the neoplasm does not extend higher than three or three and a half inches above the anal verge, excision may be successfully accomplished by the perineal method of approach. If the tumor occupies a higher level, the combined operation is decidedly preferable. It is important, however, that the abdomen be opened primarily in every case of rectal cancer in order to determine the extent of involvement and the presence or absence of metastasis, except perhaps in those comparatively rare instances in which the disease is recognized very early in its course and in which the growth is so low in the rectum that the tip of the finger easily reaches beyond its uppermost limits. By preliminary celiotomy one may also clearly determine the question of operability. Neoplasms which have extended to the lumbar

muscles, or to adjacent viscera, or which by metastasis have involved the liver, etc., have already become inoperable; in such cases the original growth should be allowed to remain undisturbed and palliative treatment applied as already suggested.

Where it is impossible to determine the extent of the malignancy by digital or sigmoidoscopic examination, exploratory celiotomy always becomes necessary. The incision should be of sufficient length to permit introduction of the hand within the abdominal cavity. In this way the extent of the disease may be outlined and the viscera palpated to determine the presence or absence of metastatic involvement. If the growth has not extended to adjacent structures, and if metastasis has not occurred, radical removal is indicated. When the abdomen is thus opened to perfect the diagnosis advantage should be taken of the opportunity to establish a colostomy, temporary or permanent in kind, as may be needed. It is estimated that in nearly fifty per cent. of instances the disease has reached an inoperable stage when the patient applies for relief, and this practically agrees with the experience of the writer.

Extirpation of the rectum, by either the perineal or the abdomino-perineal route, is not so difficult as many have heretofore seemed to believe; nor is the operation particularly hazardous if precautions are exercised to prevent infection and to protect important surrounding structures. The greatest danger of the procedure lies in the probability of infection.

If cancers of the upper rectum and recto-sigmoidal juncture, the combined or abdominal peritoneal operation is indicated. This is best accomplished by abdominal exploration, severing the rectum well above the limit of the growth; using the proximal end in the construction of a permanent colostomy; closing the distal end and allowing it to recede into the pelvic cavity; bringing the peritoneal folds carefully together, thus closing the peritoneal cavity above the rectum and neoplasm to be removed. A week or ten days later the perineal resection may be undertaken.

In extirpation of the rectum by the perineal route the incision encircling the anus should be sufficiently large to afford ample working space, no attempt being made to preserve muscular structures with the idea of securing future sphincteric function; dissection should be extended at least two inches beyond the upper margin of the neoplasm to insure amputation through healthy tissue, the rectum being drawn downward as dissection proceeds. The severed levator muscle should be carefully re-attached to the bowel and a rubber tube one inch in diameter inserted

and firmly fixed by catgut purse string in the terminal proximal end; making traction on the tube the terminal bowel is brought as near the surface as possible and held there by a large safety pin passed through the tube and allowed to rest on gauze packing previously placed in the cavity surrounding the rubber tube. If, as is frequently the case, the terminal end of the bowel does not reach nearer than two inches of the surface, great difficulty will be encountered in keeping the mucous membrane-denuded canal open. If colostomy has been established complete contraction and closure may be allowed to occur. In the relatively few instances in which colostomy has not been performed, and in those in which closure of the preliminary colostomy is contemplated, continuous efforts must be made with dilators to keep the canal of sufficient caliber to permit defecation. The use of radium to soften and limit cicatricial contraction in such cases seems very effective. In two of my recent cases of this type, in which radium was applied by Dr. William J. Young for the purpose stated, the difficulty seems to have been completely overcome.

CONCLUSIONS

(1) The incidence of malignant disease seems to be steadily increasing throughout the civilized world.

(2) The prevalence of rectal malignancy is greater than has been heretofore generally believed.

(3) The early symptoms are not always indicative and diagnosis is often delayed.

(4) Investigation of the rectal interior should be made a routine part of every general examination.

(5) Pre-cancerous rectal lesions should receive adequate early treatment to prevent malignant transformation.

(6) In operable cases of rectal malignancy the proper treatment is radical removal, but radium and roentgen-ray are useful in preventing or limiting metastasis.

(7) Preliminary celiotomy and temporary or permanent colostomy should be made in practically every case of rectal cancer.

(8) Where the disease has already progressed in an inoperable stage palliative treatment is indicated, the original neoplasm being allowed to remain undisturbed.

TREATMENT OF MALIGNANT CONDITIONS WITH RADIUM.*

By WILLIAM J. YOUNG, Louisville.

With the advent of radium in the therapeutic field, another agent was recognized as an efficient aid in the eradication, or at least having a tendency towards checking, the ravages of malignant disease. It is to be regretted that so much mystery has surrounded the use of radium by the medical profession, and that the difficulty of obtaining rock bearing the ore and reducing it to the element has made this agent so expensive. When it is remembered that the decay of radium is one-half of the original amount in two thousand years, it can be readily understood that radium merely represents a monetary investment.

Personally, I consider it unfortunate that I have to work with such an expensive agent, but I feel that the fee received is for the knowledge I am supposed to possess rather than because I am using an expensive substance. The idea of such valuable material being deposited in the tissues is perhaps the most constant error of the public, and the fact that radium is constantly giving off its rays whether being employed or not, does not seem to occur to the average individual. This and many other ideas have unfortunately produced a glamour about the application of radium, and when all these popular fancies have been dispelled, the agent will be placed in its proper sphere; and a normal retrospection will then show that it is a very valuable adjunct in the treatment of both pre-cancerous and cancerous lesions.

There are places for surgery and for the roentgen-ray, just as there are for radium, in the treatment of malignancy; and it is by the intelligent use of the one best suited to the individual case that we may hope to secure the best results. The greatest cause of conflict today is lack of cooperation among those employing these agents. Irrespective of what agent we use, unless treatment is instituted during the early stages of the disease, it usually proves only a palliative measure; and with our end-results staring us in the face it seems a pity there should be so much difference of opinion concerning treatment.

The importance of recognizing pre-cancerous lesions involving the skin, such as moles, warts, papillomas, lupus erythematosus, lupus vulgaris, etc., which are beginning to show degenerative changes and activity of growth,

*Read before the Kentucky State Medical Association, Louisville, September 19, 20, 21, 22, 1921.



1—Cancer of hand 15 years duration up to six weeks before picture was taken lesion remained size of 25 cent piece. Epitroclear gland enlarged. Treatment: Amputation of arm.

2—Duration 12 years, 1-3 nose destroyed.

3—Result from first treatment. This man was given second treatment and sends word he is well. Unable to get him for final picture.

4—Epitheloma on side of nose.

5—Shows cosmetic result 8 weeks after first treatment.

6—Epitheloma 3 years duration, caused by sharp upper incisors.

7—Result 8 weeks after treatment with radium.

8—End result after second treatment shows the teeth rounded off.

9—Reaction 14 days after application of radium, skin plague.

10—Six weeks later, only one treatment being necessary

11—Senilis Nevatosis beside lobe of ear and on neck.

12—Eight weeks following one application of radium.

cannot be too strongly urged. These so-called pre-cancerous lesions to my mind are most important inasmuch as if recognized early they are easily resolved. In radium I believe we have a safer agent than the roentgen-ray in massive dosage and capable of producing more favorable cosmetic effects. Radium is equally as effective as the knife and insures better cosmetic results.

Malignancy of the surface may be divided into three classes: (1) Basal-cell epithelioma, (2) squamous-cell epithelioma, and (3) melanotic sarcoma. The basal-cell epithelioma is easily influenced by radium. I feel safe in placing radium in the lead of other curative agents. The squamous-cell epithelioma, however, is a more resistive neoplasm and requires larger dosage. While brilliant results may follow the application of radium, like other measures, failure sometimes attends our efforts. By using massive doses we can judge as to our ability to cope with the disease without material harm or further progress of the lesion. Melanotic sarcoma is the most resistant of all and unless treated in its incipiency offers little hope of cure. Of course, the earlier the treatment is instituted in any form of malignancy the better the prognosis.

The treatment of surface cancerous and pre-cancerous lesions is usually made with a skin applicator which ordinarily consists of ten milligrams of radium element incorporated in a varnish spread over the surface and protected on its upper side with metal. The varnished area is protected on the under side by glazed material not impervious to the rays.

In discussing the treatment of surface cancer with radium, I want to lay stress upon one point, i. e., massive dosage. The method of applying treatment weekly or bi-weekly is just as pernicious in its results as a similar method of employing the roentgen-ray. My chief reason for success in surface malignancy lies in the fact that I give all the treatment the patient can stand at the first dose, and by doing this there is seldom need for a second application.

In massive dosage, on the twelfth day the lesion becomes red and vesicles appear which in a few more days form into a crust. At the end of the sixth or seventh week this crust is removed, and, correct dose having been given, a reddened scar has formed which a few weeks later becomes white. A clinical cure of surface malignancy is considered when there is a smooth pliable scar with no infiltration.

In cancer of the breast with its numerous points of possible metastasis we are confronted by a perplexing problem. In my

opinion, before any treatment is considered, surgical or otherwise, roentgenograms should be made of the chest to determine the presence of absence of metastatic involvement. This sometimes occurs early in the course of the disease, and when present within the chest will negate the possibilities of surgical treatment.

As to the dividing line between operable and inoperable cases: I believe where the surgeon has reason to conclude, after exhausting every means of determining the extent of the disease, that he can remove all foci of malignancy, he is justified in operating for extensive breast involvement; but the chance by use of the knife of causing renewed activity must always be considered. There are a small number of such cases which we apparently cure by radium treatment, but the best work is accomplished in inoperable cases by removing necrotic masses and relieving pain.

In breast malignancy, the area involved is so large and the possible points of metastasis to be rayed so many that the roentgen-ray is preferable to radium—use of the latter being confined to special points of invasion. The roentgen-ray will do the work better and in a much shorter time than radium. As is true in other malignancies, the importance of early diagnosis and treatment is often demonstrated by our therapeutic failures.

In internal malignancies radium is always to be employed in situations inaccessible to the knife or the roentgen-ray. In the mouth, nares, nasopharynx, esophagus and trachea, radium is the most direct means of relieving and in some instances curing these otherwise inaccessible malignancies. As regards the stomach and pylorus, the action of radium is uncertain owing to the inability of fixing it in direct contact with the lesion.

I have obtained a good result in a patient of Dr. Irvin Abell's by the use of radium in a cancer of the ampulla of Vater. In that case an incision was made to permit anchoring the radium to the ampulla of Vater where it was left the prescribed length of time and then easily withdrawn through the mouth. The details in connection with this case have been reported by Dr. Abell before the Jefferson County Medical Society. So far as we know it is the first attempt ever made to radiate the ampulla of Vater, and the result has been favorable, temporarily at least.

Another case I desire to mention is one of D. L. R. Ellars' in which the malignancy was situated at the pyloric end of the stomach. Fifty milligrams of radium were lowered through the esophagus by means of a string and allowed to pursue its way until



13—Typical basal cell epithelioma 14 years' duration.

14—Result 7 weeks after first treatment.

15—Result 8 weeks after second treatment.

16—Duration 10 years, involving entire lower lid and inner canthus of the eye.

17—Result 8 weeks after first treatment.

18—Result of second and last treatment.

19—Condition when first seen, Eye destroyed and patient suffering a great deal of pain.

20—Result of second treatment, patient free from pain.

21—Extensive, inoperable epithelioma of 15 years duration extreme pain.

22—Senile Keratosis on cheek.

23—Reaction on 14th day from radium treatment.

24—Result 7 weeks from treatment.

it lodged in the pyloric end of the stomach as shown by the fluoroscope. The radiation was followed by a gain in weight, and while the patient seems able to eat whatever he wants, we can hardly hope for anything beyond a temporary result. The improved condition of the patient and his ability to enjoy food encouraged us to reapply radium eight weeks later.

The fact must not be forgotten that much of our radium work is temporary in character, and it is upon this that I base the efficiency of the agent to a large extent. In many instances we only prolong life, or, to put it in more pleasant form, we give the patient a longer time to live in comparative comfort.

In the discussion of the radium treatment of internal malignancy we have a large field to cover. In the limited time allotted I can only briefly consider the methods of application. Beginning with the mouth: To treat mouth lesions successfully the radium must be in constant contact with the diseased part for a specified time, therefore dental compound is used to make an impression and the radium applicator can readily be embedded in the compound at the desired point and kept in constant contact with the lesion for the prescribed time.

In the tonsillar region needles containing radium may be thrust into the diseased areas, and many brilliant results have been obtained by this method. The treatment of mouth and tonsillar lesions is followed by severe reaction and a great deal of pain, the mucous membrane being more susceptible to the rays than the skin, hence the more painful the burn. However, when we consider that we are dealing with a disease which will eventually destroy life, a radium burn of two or three months' duration with its accompanying pain is of small consequence as compared with continuance of the malignant process. Therefore, I believe in giving this class of cases, and in fact all internal malignancies, as much radium as possible just short of a permanent burn, and by so doing my percentage of clinical cures has become much greater.

In the larynx my technique is to have a tracheotomy performed through which the patient may breathe, and to insert a tube of radium by means of a direct bronchoscope. In one case treated by me for Dr. Gaylord C. Hall, the application was followed by marked improvement of the patient with almost complete resolution of the neoplasm. The patient refused to permit a second application six weeks after the first and disappeared from observation. This is an unfinished, so far as treatment is concerned; the condition

probably reverted to its original state and steadily progressed. I believe had Dr. Hall and myself been able to control the patient and reapply radium we would have had an excellent chance to produce a cure.

In malignancy of the esophagus, fifty milligrams of radium are passed into the stricture and allowed to remain from twelve to eighteen hours. This plan has been followed by excellent results. My technique is to have an esophagoscope introduced and the distance measured from the stricture to the upper incisors, then the radium is inserted in a flexible bougie passed into the esophagus the required number of inches. The chief objection is that we are, as a rule, uncertain as to the length of the stricture, and we run the risk of further stimulating the lesion.

In malignancy of the stomach the application of radium seems to have been attended by little success except where the lesion is on the lesser curvature near the pyloric end. A case of this kind where benefit was derived has already been mentioned.

In the treatment of malignancy of the female generative tract, our most brilliant results are obtained by the use of radium. In cancer of the cervix, surgery has proven a rather futile measure. Even where the cervix is freely movable, the consensus of opinion seems to center about the radium treatment. It has been stated by a number of men of recognized surgical ability that within a short time all cases of this kind will be referred to the radiotherapist. Certainly we have more to offer than the surgeon, inasmuch as our patients show a longer life, less obnoxious sequelae, and are free to a large extent from the foul smelling discharges present in nearly all of this class. In cancer of the uterus, however, where the disease is limited to that area, to my mind surgery should be given the preference.

The technique of radium treatment in malignancy of the cervix, is to insert from one hundred to one hundred and fifty milligrams of the agent in three series of fifty milligrams each enclosed in one to one and a half millimeters of silver or brass, fifty milligrams on either side of the external os, and fifty milligrams within the cervix, making in all six thousand milligram hours. This dose cannot always be given owing to the debilitated condition of the patient. It is a matter of judgment on part of the operator as to the amount to be given, depending upon the patient's physical condition. For a permanent result to be obtained the largest possible dose should be given in the shortest time. The giving of moderate doses of radium at weekly or bi-weekly intervals is only permissible when the patient's weakened con-



25—Epitheloma under right eyelid.

26—Reaction 14 days after radium treatment.

27—Result 7 weeks after one treatment of radium.

28—Reaction from radium 28 days' duration; crust beginning to shrink.

29—End results eight weeks later.

30—Papilloma showing signs of beginning malignancy.

31—End result eight weeks later, one massive dose of radium.

dition demands it. For the eradication of malignancy a massive dose is required, and I know of no location that demonstrates this more forcibly than in cancer of the female generative tract with its recurrence in from four to six months in under-treated cases.

In cancer of the urinary bladder and prostate gland, some good results have been reported where radium was passed by sound or cystoscope. However, reports by this method are becoming less favorable, and there is now a tendency to treat these cases by the direct method; that is, by doing a suprapubic cystotomy and introducing ra-

dium into the diseased part under direct vision. What small success I have obtained in this field has been by the direct route, and naturally I consider that the most advantageous plan of treatment. The prostate can be better reached by the suprapubic than by the perineal route with the insertion of long needles.

In cancer of the rectum we have two conditions to consider: Where the malignancy is low enough to be removed it should be surgically excised and radium then used to further reinforce the work of the surgeon. Radium may have a two-fold purpose in these

ceses, as the tendency of the anal canal is to contract and in a short time close, necessitating colostomy. It may be possible by the use of radium to resolve the scar tissue formed and at the same time remove any malignancy remaining. Dr. Bernard Asman and myself have two cases of this type under observation at present and hope later to make a favorable report on their amenability to radium treatment.

The other class is where malignancy exists high in the rectum and the surgeon is unable to determine its extent, as is often the case. The only technique worthy of mention is that of preliminary colostomy followed by radium treatment through the colostomy opening and also through the anus. The only excuse for those who treat cancer situated high in the rectum without preliminary colostomy is that the patient is a bad operative risk or the desire to collect a fee. After colostomy has been done and the irritating fecal matter removed from the lower intestine and it is allowed to remain at rest, a double chance is given the radiotherapist to treat the malignancy. In a few of these cases the condition becomes operable and the patient is returned to the proctologist.

Whenever possible and feasible, in all cases where radium is used, the result should be further augmented by roentgen-ray treatments. The point of greatest interest is the amount of radium the patient can stand without nausea and subsequent depression. This is a difficult question to decide and must be left to the radiotherapist, that is the amount of radium the patient can safely stand rather than the amount needed. In other words, in our efforts to conquer the malignancy, we must not lose sight of the physical resistance of the individual.

In the management of cancer cases it is not always advisable to inform the patient of the existence of malignancy, but it is the duty of the physician to tell some responsible person in the family of the diagnosis and the prognosis. Personally, I dislike to give a bad prognosis, but this is an obligation which we assume when examining these hopeless cases and has to be met however unpleasant it may be.

The surgeon has held the position of arbitrator in malignancy for many years, and it is neither wise nor just that his knowledge and judgment be cast aside because a new remedial agent has been discovered. It remains with the surgeon whether he retains his position by accepting these adjuncts and allowing them to perform their part of his work. The greatest bone of contention today between surgeon and radiotherapist is what shall be considered operable and in-

operable lesions. When the lines are more closely drawn, team work can be better performed and more favorable results expected.

The most successful work in internal or deep malignancies has been done by me when cooperating with the surgeon who deserves first place in considering the treatment of cancer. The roentgen-ray and radium should be regarded as adjuncts to his work when lesions are operable, and when inoperable his advice and cooperation are much to be desired.

It is pleasing to the radiotherapist to note that the success of radium has been generally recognized by the medical profession. The radiotherapist should more firmly establish this feeling of confidence by doing sane and conservative work and not try to beguile the public into false hopes of miraculous cures. When all has been said and done, whether we use surgery, the roentgen-ray, radium, or all of them, we are too often confronted by the fact that we are sadly in need of a cure for cancer.

DISCUSSION:

R. C. McChord, Lebanon, was asked to open the discussion on this symposium. He said: It is not expected that I am to discuss the question of cancer in general or any of these papers collectively, but I propose to discuss the subject briefly of cancer of the breast, as brought out by Dr. Sherrill, and will therefore only discuss a very small portion of that phase of the subject.

The essayist has practically and thoroughly covered this subject with relation to our present knowledge of cancer of the breast, both in importance of diagnosis and treatment, but there is only one phase of the subject that he failed to discuss, namely, its prevention.

The most common benign tumors in the breast are the fibro-adenomas. Aside from these we have retention cysts, lipoma and enchondroma. All these tumors are likely to occur in young patients and may or may not be accompanied by retraction of the nipples. These tumors are movable, they are not accompanied by pain as a rule, and frequently grow slowly and do not attain any considerable size, but as age advances these tumors, with the exception of lipomas, have a tendency to become malignant, and it is a wise procedure to remove all these benign tumors in this locality as soon as they are discovered. The operation is simple, it causes no inconvenience, and it can be done generally under local anesthesia, thus relieving anxiety for the future and a possible impending danger.

Dr. Sherrill has called our attention to the danger of manipulating these tumors too much. He has also wisely called our attention to an operation that was originated by the late Dr. Rod-

man, who was the first man to advocate dissecting the glands and ligating the blood supply to the breast before undertaking to remove the breast. That is one of the improvements in the operation. It is of great assistance not only in preventing the extension of the disease by attacking the axilla first, but you can control hemorrhage that leads to the breast and in that way you can accomplish the operation so much better.

P. H. Stewart, Paducah: From my viewpoint, this symposium on cancer is the most important which has been presented before the Kentucky State Medical Association so far as my memory goes. The papers were all splendid, up-to-date, and I believe we will all go home feeling we have derived wonderful benefits from having heard these papers this afternoon.

There are many points that might be brought out, one especially to which I should like to call your attention, and that is the correction of those conditions which ultimately are likely to result in malignancy. I refer to lacerations of the cervix especially, and we all have them, and if they are not corrected, your patient is sooner or later subjected to a vital risk. Early recognition and the correction of these lacerations are very essential, and I believe it would be a good thing for the Kentucky State Medical Association to put on within the confines of Kentucky in the public schools, through the public press an educational propaganda, such as was carried on and referred to by Dr. Frank in the Ladies' Home Journal, notifying and calling the attention of the public of Kentucky to the danger of these tumors and conditions which are precancerous, so that they might have them corrected early and reduce the mortality of cancer.

Relative to the use of radium in the treatment of cancer, I am free to confess that my knowledge is very limited. I do believe, however, there is a danger that should not go unheralded. I believe that radium may some day supplant the use of the knife in surgical work, but I would like to appeal to these radiotherapists to be sure that when they bring us the news and message that radium is superior to surgery in the treatment of malignancy that they know well the ground on which they stand.

George A. Hendon, Louisville: It is hardly to be expected that one can give anything like a careful or analytical consideration of this very extensive subject in the short time allotted. There are six papers, and if we had three minutes to each paper we could not get very far with the discussion.

Relative to the treatment of cancer by radium, which is the newest and most interesting addition to our therapeutic armamentarium at the present time, I would say that there are some very important considerations of technic to be very carefully observed, one of which is the fact that the mere contact of radium with the infective area

does not suffice. It seems to be the observation of men who have had a wide experience that in order to get the greatest degree of benefit from radium it must be buried in the affected tissue. In precancerous conditions radium is almost an absolute cure; what I mean by precancerous conditions can be best illustrated by certain lesions that appear in the cervix, ulcerations of the cervix, cysts in the cervix and polypi in the cervix. Lesions of that kind we know ultimately in many cases, result in cancer. Now, what makes radium valuable in these conditions is the fact that we would not do hysterectomy for a condition of this kind, but we would not hesitate to apply the radium.

Another consideration is, that in order to logically and effectively deal with the subject, these cases of cancer should be all classified for different forms of treatment. The most comprehensive, most gratifying, and the most satisfying article that it has been my good fortune to read on this subject is one written by Harold Bailey of the General Memorial Hospital, New York, and appears in the transactions of the American Gynecological Society of 1920. In this article he classifies these cancerous conditions as advanced cancer, far advanced, operable, the borderline and inoperable. In the far advanced cancers his conclusions are that it is really unwise to use radium when there can be no apparent cure. He admits that you do get a palliative effect from the use of radium. The hemorrhage is controlled, and the foul smelling discharge is abated. On the other hand, the benefit you derive is offset by the development of fibrosis which he says, in the end cause the patient a greater degree of pain than ordinarily occurs without the use of the radium.

W. W. Anderson, Newport: I have been asked to address myself to the discussion of the need of early diagnosis of malignancy of the gastro-intestinal tract. For several years we have been drifting toward specialism, and there is a tendency to the elimination of the general practitioner. The skin specialist is sure that the general practitioner should know more about skin lesion than he does. The lung specialist is sure that the general practitioner overlooks tuberculosis until it is too late. The heart specialist is in the same class. The gastroenterologist assures us that we are neglectful and send our cases to him too late. The surgeon, when he gets to discussing malignant disease, becomes malignant himself in blaming the general practitioner for the large percentage of failures in surgical intervention in malignant disease. The field of the general practitioner is so broad and it demands men who are especially skillful in so many lines, that as such we must make the skin and its contents familiar and be perfectly efficient in all. I want to suggest this one thought. The only way we can approach the problem is this:

We who are doing more or less general practice, should devote ourselves to becoming especially skillful in some one department of our general practice. It is not possible to have a skin specialist, a lung specialist, and a gastroenterologist in one man, but it is perfectly possible for a general practitioner to become a specialist in the diagnosis of skin conditions; it is possible for one in doing general practice to be especially skillful as a gastroenterologist, and the next man to become an expert in the diagnosis and treatment of lung conditions. If each one would take some line and make himself very proficient in that line in connection with his general work, in his neighborhood he will be consulted and considered to be a valuable man. It would be a convenient thing for general practitioners to consult with and cooperate with such a man rather than to call in an exclusive specialist, and he will not make the egregious blunders the exclusive specialist makes because of his narrower view.

Guy Aud, Louisville: I am very sorry we have not more time to devote to this discussion, because I do not think there can be any question but what this is by far the most important symposium presented before this society for a long time. I am down to discuss Dr. Blackburn's excellent paper, and I shall confine my remarks to it.

Every essayist who has addressed the Association today has tried to impress upon us the fact that hope of any permanent cure in malignancy depends on early diagnosis. I can only emphasize that point. We all know malignancy is primarily a local condition, and in practically every instance, if we get it early enough, it is thoroughly eradicable and may be definitely and permanently cured. Of course, there are locations in which malignancy may be so situated that we cannot get at it by any means we have at our disposal. The thing we can do and must do is to try and get our patients early. This can be done, in the first place, by putting on educational campaigns. This to my mind is the most important single thing we can do. I do think many cases of cancer are impossible of diagnosis extremely early. We must educate the people to come earlier, particularly those who have gastrointestinal complaints. These patients, as a rule, come to us very late; they come to us after they have metastases, and at that time the condition is absolutely hopeless. All we can do is to resort to palliative measures. If you get cases of gastrointestinal malignancy sufficiently early a large percentage of them can be cured because malignancy in practically every portion of the gastrointestinal tract is operable. I think surgery offers more in malignancy of the gastrointestinal tract possibly than it does in malignancy located superficially, because with our present knowledge of x-ray and radium we accomplish very little in malignancy in these situations. We are able to

do resections of the gastrointestinal tract and stomach and certain portions of the duodenum, and I might say all the rest of the gastrointestinal tract, provided we have no metastases, and we are getting a very high percentage of cures, provided we get the cases early.

Irvin Abell, Louisville: This is not only the most important subject that can be presented to this society, but I take it, it is the most important subject before the medical profession at the present time. Any disease that has an annual mortality of 100,000 is certainly a live and burning subject. Consider what consternation there would be if smallpox resulted in the loss of 100,000 lives annually. Consider the consternation when the great war took 80,000 lives, and yet 100,000 die of cancer without a passing comment.

In the short time at my disposal there are only one or two points I wish to mention, one of which has been brought very forcibly to my attention in studying my own work in a series of 300 cases in which the average time before the patient came under observation was 15.8 months. Any woman with breast cancer of 15.8 months duration is practically hopeless when she comes under any type of treatment, whether surgical, x-ray or radium. This to me is the crux of the whole situation. I am sure many of you are familiar with the aims and purposes of the American Society for the Control of Cancer, which is putting on next November a propaganda for the dissemination of knowledge regarding cancer among lay people. This education must be two fold. First, the doctors must make an early diagnosis, and second, the lay people must come to us early enough for us to make a diagnosis. As to the diagnosis in cancer of the gastrointestinal tract we are able with the X-ray to make a diagnosis in 95 per cent. of the cases before there is a palpable tumor regardless of how thin the individual may be. One important factor which I do not think has been stressed enough is the importance of removing a piece of tissue for examination. Each essayist has stressed the fact of the symptoms as taught, regardless of whether we have cancer of the uterus, the stomach, or the breast. When a patient comes in with cancer of the breast discloses a retracted nipple and often the axillary glands are enlarged. Nothing will cure over 5 per cent. of such cases. What we want is to get these patients to come to us sufficiently early so that we can make a diagnosis when the tumor is small, when it requires the microscope to detect it.

Reference has been made to frozen sections. We have made 70 odd frozen sections at the time of operation, and in only two instances has the primary diagnosis been modified by the imbedded sections. My impression of radium is that superficial lesions may be readily destroyed by it, in deep lesions if we wish the best effects at the time

of removal of the tumor the radium should be imbedded in the operative area in large, intensive doses, and in so far as our experience has gone this treatment has been most satisfactory. I think in operative measures, we have probably reached the extent of development which surgery will permit, and that with a combination of radium, x-ray and surgery we will be able to reduce this tremendous mortality of 100,000 a year.

J. A. Davis, Covington: The only part of this symposium to which I desire to address myself is the use of radium. We own no radium but have the use of it at all times. We have heard papers and discussions on it since the first of June, in Cincinnati, Washington and Rochester, and there has been more enthusiasm displayed in the use of radium here today than in either of the other places. Radium has sifted itself down to its use in two particular instances in which it is undoubtedly of benefit. First, in superficial malignant disease of the skin, and second in the destruction of the blood supply of carcinoma of the uterus, and cervix, controlling the hemorrhage. In all other parts of the body, particularly the deep tissues, it has been very questionable whether any benefit has come from the use of radium.

D. Y. Keith, Louisville: My experience bears out what Dr. Frank and Dr. Young have said in regard to radium. I want to emphasize that my limited experience agrees with what Dr. Hendon and Dr. Abell have said, namely, the future of radium is going to be with burying the needles or emanation into the margin of the tumor, the margin is the most malignant part. It seems to me, from the results we have had the surgeon should bury the needles into the tumor mass. In a greater number of instances this can be done under local anesthesia. The burying of needles of course does not apply to superficial malignancies in all cases.

We have many practitioners who send us a great many patients after operation for radiation. I believe it would be a decided advantage to all patients, on account of the distance they come to the city, to have three series of radiation, two series before operation the second given 10 or 12 days after the first series, preferably they should have two after the operative work is done. Preoperative radiation makes the malignant cells sick and certainly a devitalized cell will not transplant easily.

Dr. John G. Clark in a recent address before the Pennsylvania Medical Society makes the statement that no metastasizing tumor is ready for surgery until properly prepared by radiation. In the same address he stated that whenever the glandular area in the axilla in a breast tumor is taken out, it is the only barrier the patient has in the way of protection from general malignancy. His practice is to prepare patients preoperatively and at the time of operation to re-

move the glands, leaving the capsule untouched, and the burying of radium emanation in small capsules in the capsule of the gland.

In reply to Dr. Asman that he has not seen a cure in cancer of the rectum, if he will refer to the Kentucky State Medical Journal about a year ago he will see the report of a case of cancer of the rectum treated by us with x-ray and the radium was given by Dr. Burnam and Dr. Kelley of Baltimore, and the man has passed beyond the five year period. It was a case of recurrent carcinoma after operation. The patient came to us about six months after operation with mass the size of a hickory nut with great pain. The pain was relieved completely by x-ray radiation, the radium was given after the second series of x-ray.

John W. Price, Jr., Louisville: This symposium we must recognize as propaganda to fight cancer in the State of Kentucky. We have had a series of excellent and well prepared papers. I think the members of this society ought to take this propaganda to their county societies and have symposiums among the men throughout the state who are unable to attend this meeting. My own observation of propaganda against cancer extends over 20 years, and it has been a flat failure. In the past year in five months service in one of the hospitals we did not have one single case of carcinoma of the cervix which was operable. In former years we would have one or two cases each year. Patients that came in the operable stage were treated with operative measures, and this year they were all treated with radium which is recognized as a palliative measure.

In regard to carcinoma of the breast, we did not have a single case with carcinoma of the breast which was inoperable. The breast is easier to see than the cervix, or is so considered, but as a matter of fact, the cervix is just as easy to see as the breast, and there is no reason why these cases of cancer of the cervix should not be recognized and treated promptly before the cancer has had time to develop to any extent. Every woman who has a lacerated cervix ought to have that laceration sewed up. I do not believe a woman should be allowed to have a lacerated cervix for two or three years with the expectation that she will be all right. All lacerated cervixes should be sewed up. There are many women who go on for years between pregnancies with lacerations that ought to be sewed up promptly, and if the thing were done, it would eliminate a large number of cases of cancer of the cervix developing later. I think these lacerations ought to be repaired at the time of confinement, if all conditions are favorable.

Hugh N. Leavell, Louisville: I would expunge from the records in reference to cancer of the breast the word "precancerous," if the essayists will allow it, and put the whole thing in one sentence, and that is, "all tumors of the

breast are potentially malignant," and it does not make any difference when you see a tumor of the breast whether you think it is cancerous or not, or whether anybody else thinks it is cancerous or not, it should be removed.

Any one with a reasonable degree of skill can palpate a tumor in the breast. I say a reasonable degree of skill. It requires a certain touch or manipulation, particularly with the finger tips themselves, not necessarily the arms or the hands. Grasping the breast in palm of one hand and sliding the finger tips over the breast with the other hand you can palpate the tumor more readily, particularly a pendulous breast, than you can in any other way. With the diagnosis made the tumor can be removed through the incision mentioned by Dr. Sherrill. You can make the incision in the lower border, turn the breast back and remove the mass from the breast without any damage or leaving any scar of the breast. I do not believe Dr. Sherrill contemplates using the Rodman method of operation as Dr. McChord said. He has deviated from that and has perhaps improved it in some ways, but I believe we cannot obtain results from this incision that Rodman obtained in obliterating the scar which is essentially made in all these operative measures. If a scar is left in the axilla to that extent it prevents mobility of the arm. The arm is necessarily clamped down upon the chest after such operation. No arm need be involved after operation.

Louis Frank, Louisville (closing on his part): First of all, I want to say a word or two in defense of my own paper. I think Dr. Sherrill is absolutely mistaken. The trend and tendency today is toward the abandonment of operative measures even in early carcinoma of the cervix. I will grant you, the best time to operate on these cases is in the beginning, but I would like to compare my own statistics of cases we have treated early with those of any gentleman who has resorted to extirpation, etc.

As to the action of radium which Dr. Hendon touched upon, we have treated some 300 or 400 cases of cancer in various parts of the body with radium, but we are not discussing those cases except with reference to cancer of the uterus, and particularly of the cervix. We do not advocate radium treatment for cancer of the body of the uterus. The surgical results in these cases are so excellent that it is impossible to hope for anything better. The uterus is peculiarly and especially adapted to treatment with radium.

I also agree with the gentleman that the radium should be buried in certain cases and that the results to be obtained are secured from the first and second treatments. To speak of massive doses of radium just as of massive doses of x-ray does not mean anything. I do not know what these gentlemen mean by massive doses. Do you mean to use 200 or 300 milligrams? If so, how

many hours? The question depends on the millicurie hours. Six thousand millicurie hours is a massive dose. Most excellent results may be obtained by using 100 milligrams of radium which is really all it is necessary to have. We should speak of milligrams and millicurie hours.

In any surgical operation for the removal of carcinoma, if we do not get absolutely outside of the diseased tissue we have a rapid spread. In the same way, if you do not get the proper dosage of radium or x-ray, you may have a stimulation of the cancer.

As to the action of x-ray; it not only destroys the cancer cells, but produces new fibrous tissue, thus strangling or starving any cancer cells which may remain. It is this latter action we think which retards the growth of the disease in those cases which are not actually relieved. Radium also brings about hyalinization of the tissues in which the cancer cells are imbedded, which we know is one of nature's means of arresting the disease.

I regret that the time for discussion is so short that we cannot speak to the other papers.

John H. Blackburn, Bowling Green (closing on his part): I heard a Memphis surgeon remark some years ago that in a rather limited time he had operated upon nine cases of perforated gall-bladders, and I was led to state in a discussion of the paper that it seemed to me he and his physicians who referred the cases ought to have a little heart to heart talk. That leads me to remark that Moynihan stated on one occasion that a perforated gall-bladder is no more a symptom of gall-stones than is a lacerated perineum a symptom of pregnancy. These medical classics of ours have been written at the postmortem table, and some of them will have to be rewritten by the side of the operating table.

As regards the propaganda for the prevention of cancer, if we doctors do not get into our heads that operation must be done early, how is the man who is sending us these cases with tumor, cachexia, anemia, and all of the evidences of the late stage of cancer, going to know that operations might be done earlier? It is necessary to educate the average practitioner first and the people later. It occurs to me, the thing for us to do is for every man who has heard this symposium to go home and take it to his county society and get the members of that county society interested and take the message to our people as we meet them in the daily walks of life. Only by that means can we hope to accomplish much good. Certainly, so far as my experience goes, the doctors are not learning very rapidly that these cases must be taken early.

J. Garland Sherrill, Louisville (closing on his part): I wish to thank the gentlemen for their liberal and favorable discussion. To make an early diagnosis, it seems to me it is not possible

to diagnose disease before it begins, but if we would advise our patients and let the public be advised to undergo a complete physical examination, we would be able to detect many cases of a beginning growth in the breast, the stomach, intestines, and in the uterus which are now overlooked. That is the only way in which we will get these cases early. Every one of us has seen intestinal cancer going on to complete obstruction before the patient has called a physician's attention to the matter. Every patient who has bleeding at any time from the intestinal tract should consult a physician; every woman who has a tumor of any kind in the breast, as Dr. Leavell says, should go to a physician for diagnosis. When we consider 80 per cent. of all tumors of the breast are malignant, and the great majority of these cases are malignant at some time in their course, we should give due weight to the contention of Dr. Leavell. Any woman who has a growth in the breast is always uneasy, and what we want to place before the people is the symptoms of early disease of a carcinomatous nature, and in that way get their cooperation in order to help to blot out this enormous economic waste of 100,000 lives a year. It is only by complete and thorough annual examinations that we can reach this point. What better and what cheaper insurance can you provide for yourselves and your family than to have an examination made once every twelve months. No doctor can examine a patient without the consent of the patient. It is very essential to educate patients to see the advantage of such an examination. If a patient complains of a growth in the breast which may be potentially malignant, it is very essential for us to make as complete an examination as possible at that particular time, and not defer it until next week or next year. It is only in this way that the mortality from cancer can be reduced.

With reference to the precancerous stage, a patient either has the disease or she has not. Therefore, we cannot have so-called pre-cancerous disease. Nevertheless, if these cases of irritation are taken early we can prevent those things which tend to produce cancer. As Dr. Abell has stated, if there is extensive involvement of the axilla, the patient has a slim chance for cure.

As regards the use of radium, I hope those gentlemen who have spoken of it are correct in their statements, because nobody will be more pleased to see malignant disease of the uterus and of the breast cured by radium than I. My experience, however, leads me to believe that we cannot advise the public to abandon operative removal of malignant disease in the early stage, and it is dangerous teaching to tell the public that cancer can be cured by radium alone. I have seen cases go to the radiologist and when they came back to the surgeon they were inoperable. I

have seen many cases of superficial carcinoma relieved by radiation, but uterine cancer usually demands a radical operation. If you wish to follow the use of radium or precede it by operation, all right, but massive doses of x-ray will do more to control its spread in the glands of the pelvis than radium.

Bernard Asman, Louisville, (closing): I was very much pleased to hear Dr. Keith tell us that he has been able to secure a cure of recurrent carcinoma of the rectum from the use of radium alone. I searched the literature very fully and have been unable to find a single case of cure of carcinoma of the rectum by the use of radium alone. I do think, however, after complete extirpation of the rectum for malignancy, the application of radium later on to prevent a recurrence may be of some utility.

As regards the general value of radium, I am in accord with the views expressed by Dr. Sherrill.

Intravenous Use of Corpus Luteum Extract in Nausea of Pregnancy.—Intravenous injection, John C. Hirst, Philadelphia (Journal A. M. A. March 19, 1921) believes, is the ideal method of administration of corpus luteum extract. The material used is carried directly into the circulation, giving the most rapid absorption possible. It is possible and advisable to use a considerably larger dose (two or three ampules) than is possible with the intramuscular injection, in which more than 1 c.c. causes considerable local reaction. Each ampule contains only 0.2 gm. of the extract, and in this way the necessary total quantity can be introduced more easily and quickly. There is no local reaction or discomfort of any kind after the injection. Intravenous administration often controls the vomiting promptly, in cases in which intramuscular use has failed. The method of administration does not differ materially from the ordinary intravenous injection. The dosage will vary, depending on the type of case under treatment. Ambulatory patients who can come to the office usually receive 2 c.c. every other day. In more severe cases, when office visits would be a hardship, the patients receive 2 c.c. daily, given at home. In pernicious cases 2 c.c. is given twice daily and the patients confined to bed. Experience has shown that every patient should receive at least 12 c.c. entirely irrespective of the fact that they respond quickly and favorably to a smaller number. If fewer are used, relapses are common, and are more difficult of control than the original attack. Anaphylactic reactions need not be feared. The presence of a goiter in early pregnancy absolutely contraindicates the administration of corpus luteum extract, either intravenously or intramuscularly, for the control of nausea. In Hirst's experience, every such patient has been made much worse by this treatment.

AIDS TO DIAGNOSIS IN MEDICINE*

By HENRY ENOS TULEY, Louisville

We approach the subject of this paper with some misgivings, as at the outset we must disclaim any originality or the outlining of any new discoveries. We are attempting rather to call to mind aids to diagnosis which we feel are often overlooked or neglected.

We think the medical profession, both general practitioner and specialist, might be condemned for laxity in methods and a tendency to the development of a routine leading to "snap" diagnoses. The treatment of patients without adequate investigation, is unquestionably in vogue.

We maintain that a careful, painstaking written report of the personal and family history, followed by a thorough physical examination of a patient, is a *sine qua non*, before an opinion can possibly be expressed in regard to the individual patient, proper advice given or adequate treatment instituted.

Hughlings Jackson in 1870, pointed out that the study of the individual patient comes before the study of the disease, for a disease is rarely typical but is modified by the characteristics of the patient.

In the effort to standardize hospitals the greatest stress has been very rightly laid upon case histories, for they are certainly the basis for the intelligent and scientific care of the patient.

With an average clientele, it is beyond possibility for any practitioner to remember the details of the illness or disability of any patient for any length of time, and entirely impossible for scientific reports to be made with clinical data to support them unless careful and painstaking histories are taken and as careful physical examinations made and recorded. To those who are content with merely keeping a copy of prescriptions written, or who record in a day book or visiting list some sign indicating the service rendered and charge to be made, we urge the adoption at once of hospital methods of case history records. A trial of the complete method will certainly convince the doubters of the wisdom of this routine.

The younger generation of physicians is thoroughly grounded in the methods of history taking and the importance of accurately kept records, to the physician, to the hospital and to the patient.

During the sessions of the school, the histories and physicals of all new patients in the Hospital Wards are taken by the students

and when corrected by the staff or instructors, are typed and made part of the permanent record of the Hospital. A duplicate of the history and physical is filed in the library—like diseases and conditions grouped, as a reference library for new classes, and the original is returned to the student for his files. This relieves the interne of much routine work and gives him more time for other work on the ward and for special laboratory investigations.

THE CLINICAL HISTORY

The clinical history consists of five parts, and is not complete without all five headings are dealt with:

1. *Anamnesis*, or an account given by the patient, or friends, of the life of the patient previous to the time of the examination. Leading questions should not be asked until after the patient has told his story.

2. *Status Praesens*. This includes the physical, chemical and biologic examination made by the physician. We wish it were possible to emphasize forcefully enough the importance of the education of the special senses in their application to physical diagnosis, and the correlation of these findings by an active, discriminating brain. The outcome of this is the development of a clinical sense, that ability which comes with training which enables one to place a precise value upon symptom or sign. Through the aid of this clinical sense one is able to arrive at a diagnosis by the differential, direct or indirect method.

3. *Clinical Impression*. The recording of one's impression of a case, even though a positive diagnosis is not or cannot be made, is an excellent discipline for every practitioner, be he surgeon or internist. Pre-operative diagnosis or impressions are as important, perhaps more important, than an ante-mortem diagnosis in a purely medical case.

4. *Catamnesis*. This is the subsequent history of the patient, including notes on the course of the disease, the kind of treatment used and the results thereof.

5. *Epicerisis*. This is the final judgment of the case with discussion of all findings. If the surgical or autopsy findings are available, they should be summarized under this heading.

Medical literature has contained many articles of late, emphasizing the tendency of the profession to neglect the art of physical diagnosis. We feel that in a measure this criticism is just, though we do not believe, as has been said by one author, that physical diagnosis is a lost art. This criticism is borne out by the questions asked by most life insurance

*Read before the Kentucky State Medical Association, Louisville, September 19, 20, 21, 22, 1921.

companies in their medical examination blanks. "Has this examination been made without removing the clothing covering the chest?" How can a chest examination be made through one or two shirts? Yet it is constantly being done.

Inspection, palpation, percussion, auscultation, mensuration! How pregnant with meaning if properly applied. Keeness of vision, seeing, feeling and hearing understandingly can only be acquired by constant application, through mastering of the normal, and its comparison with the abnormal. We are constantly endeavoring to impress this fact upon the younger clinicians in their teaching, that the healthy student himself is the best clinic possible for the sophomore student upon which to begin his practical work in physical diagnosis. The student must first be taught physical diagnosis from the physiologic standpoint, normal breath sounds, normal heart sounds, normal heart dullness, normal resonance, normal chest measurements, etc. The sounds and conditions produced by pathological conditions can then be more easily recognized. Closer co-operation between the so-called pre-clinical branches and the clinical in medical schools must be had. The well rounded general practitioner is the product we are endeavoring to send out from our medical schools, not specialists in any branch.

The use of the special senses, with instruments of precision, and by chemical, bacteriological and biological methods is rapidly bringing medicine into the domain of a science. It is being said that only the special senses and instruments of precision are necessary in diagnosis, that the laboratories are not needed, that they are refinements for which the patient must pay, but add little to the outcome of the case. We do not believe it is necessary to combat this idea in the presence of this audience, but rather to briefly call attention to certain of the diagnostic aids, which can and should be used by the practitioner in his daily work. Many general practitioners do not use these aids, fearing they need too elaborate an equipment and for this reason do not familiarize themselves with method or technic. As an illustration, a group of eight practitioners recently in attendance at a City Hospital clinic, not one knew anything of the phenolsulphonethalpine test for kidney efficiency or had ever seen it applied. These men had missed using a valuable aid in the estimation of kidney efficiency, and their patients the benefit of this procedure. This test is so easily done and at so little inconvenience to the patient, that it should be used as a routine in all patients in whom disordered function of the kidney is suspected. It is a routine procedure in the Louisville

City Hospital, and is considered a most valuable clinical procedure.

Gerstley* has sounded a note of warning against too great emphasis being laid upon pathology in reasoning in regard to the epincrisis of a case, to the exclusion of the physiologic point of view. He states: "To the medical man of the future, far more important than the problem, 'What are the pathologic findings in this intestine, in this heart, in this kidney?' will be the diagnosis. 'What is the tolerance of this intestine to food, the capacity of this heart or this kidney for work?' The community will demand of us that we apply all our skill in keeping the child at play or at school, the adult at work. This physiologic point of view has given rise to a change in our conceptions of therapy infinitely more fortunate than anything developed from the pathologic standpoint."

FUNCTIONAL TESTS OF THE KIDNEYS

This is an introduction to the mention of the physiologic or functional tests of the kidney which are so little used. The value of the concentration urine test is too little appreciated. It is not necessary to put a patient upon the elaborate Mosenthal or other diet, but carry it out with the patient living his usual routine as to food, drink, exercise, rest, etc. All fluid intake is carefully measured, recorded and totaled for the periods from 8 A. M. to 8 P. M., and from 8 P. M. to 8 A. M. The day urine is passed at two-hour intervals and saved in separate bottles, and the night urine saved in one specimen. The specific gravity, amount, and reaction of each specimen is carefully taken and recorded. If there is a fixation of the specific gravity of less than 9 points, or an intake of 25 per cent more fluid than the total output of urine, or if there is a nycturia, or a larger amount passed during the night than during the day, there is a serious functional disturbance of the kidney. This may be found in the absence of albumen and casts. This tells us what the kidneys are doing, their capacity for work. If, in addition to this, there is a reduction in the percentage of phenolsulphonethalpine recovered in the one and two hour specimens, we have learned more than can be told from a dozen chemical urinalyses.

These are tests which can be made by anyone and should be a routine in all patients in whom the kidney function is questioned. There is absolutely no difficulty in obtaining the co-operation of the patient in carrying out the directions for these functional tests in detail. The patient realizes that the results are of vital interest to him and there

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is no trouble in obtaining his fullest co-operation. Emerson has done excellent work in his studies of nephropathies and his latest report* calls attention to the necessity for a study of the temperature and albumin concentration curves in chronic nephritics—as all patients with chronic nephritis show, at times, slight rises of temperature and definite changes in the blood and urine.

Preventive medicine is economically important. Emerson points out (*loc cit*) that the kidneys are the third organ of importance as a cause of death, and regular examination of kidney function in the apparently well cannot be too forcefully emphasized. Do not be content with a chemical and microscopic examination of the urine, but learn the capacity of the kidneys for work.

BLOOD CHEMISTRY

Of what value is the newer blood chemistry as originated by Folin and others? Estimation of the retention of nitrogenous products in the blood is of very great value in the summing up of a case, especially as to prognosis. Total nitrogen, urea nitrogen, urea, and creatinin in excess in the blood corroborates the functional test and clinical findings. To illustrate: A graduate nurse on private duty complained to the physician in charge of the

patient she was nursing, that she did not feel well, she had a temperature, headache and her feet were swollen. He asked for a specimen of urine, and it was almost solid with albumen after boiling. She came to the hospital and was admitted to the metabolic ward under Doctor John Walker Moore, Professor of Research Medicine. She gave a history of a recent attack of tonsilitis, the Hospital admission diagnosis being acute toxic nephritis, which any tyro could have made. The following is a resume of her case:

Aged 28. Entered hospital January 17, 1921. Chief complaint, swelling of feet, hands and face; drowsiness and headache; decreased urinary output. On January 9th. had a chill, followed by swelling and soreness at angle of right jaw, with pain over right antrum accompanied by discharge of thick bloody pus, which persisted three or four days and gradually subsided. Had an abscessed tooth, which was extracted five months ago, with three more found abscessed and later extracted.

January 17, 1921, blood pressure, 130-70.

URINALYSES.

January 17th	January 20th
Color	Amber
Appearance	Very turbid—smoky.
Specific Gravity	1.043
Albumen	Plus 4. Solid cake.
Microscopical—	Large number fine and coarse granular casts.
	Leucocytes and Red Blood Cells.

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BLOOD CHEMISTRY.								
January	17th	19th	20th	22nd	24th	26th	Feb. 8th	
Total Non-Protein Nitrogen	61.8	98.4	81.	68.	42.	31.2	32.6	
Urea Nitrogen	37.5	51.7	49.	39.	21.	13.	14.3	
Creatinin	6.	6.	5.	4.	3.	2.9	1.4	
Uric Acid	5.					4.5		
Plasma Bicarbonate	51.9	48.5		53.2		58.		
Aleosomal CO ₂	32.5 Vol. %							
Blood Pressure	130-72	115-70						
January	18th	19th	20th	21st	22nd	23rd	26th	30th
Fluid Intake	1180 c.c.	1090	1090	1165	1010	773	1000	800
Urinary Output	264 c.c.	369	602	1120	1007	1718	1065	711

6 points variation in specific gravity in two hour specimen on the 21st.
8 points difference in specific gravity in two hour specimen on the 30th.

On February 12th, the patient was discharged. The kidneys were able to concentrate, fluctuating twelve points daily.

We believe the blood chemistry findings were of the greatest aid in the care of this patient during the acute stage, and the subsequent treatment much more intelligently carried out with the blood chemistry known than if it had not been done.

We would especially emphasize the importance of blood chemistry, as a routine in surgery as a means of ascertaining the operative risk to the patient. This is especially true in genito-urinary surgery. We believe some fatalities in prostatic surgery might be avoided if careful blood chemistry examinations were made.

The finding of creatinin above normal limits of its especial prognostic importance, espe-

cially in acute surgical conditions of the genito-urinary tract.

In this connection, we would state that a regular part of the training of undergraduates is an attempt to teach them bio-chemistry in their Junior year and a practical application of these methods at the bedsides in their senior medical work. The general practitioner need not fit up a laboratory for the carrying out of these tests if he is too busy, as laboratories are available where they can be carried out, if he will send to them a specimen of oxalated blood. He should, however, familiarize himself with the normal limits of the various nitrogenous products and the significance of their increase.

The following are the upper normal limits of the various blood chemistry findings:

Total Non-Protein Nitrogen	25-35 mg. per 100 c.c. blood
Urea Nitrogen	12-16 mg. per 100 c.c. blood
Cretinin	1-2.5 mg. per 100 c.c. blood
Uric Acid	1-2.5 mg. per 100 c.c. blood
Plasma Bi-Carbonate	54 to 77.
Alveolar CO ₂	40 to 45 Volume %
Blood Sugar	80-120 mg. per 100 c.c. blood

POLLINOSIS

No class of sufferers, perhaps, are more appealing than those subject to pollinosis or asthma, hay fever, the urticarias, eczema, angioneurotic edema, erythemas, diarrhea, etc.

Much original work has been done in the study of anaphylaxis and allergy by many observers, yet the average general practitioner seems to think but little of the possibilities of this field of endeavor.

Bronchial asthma has long been considered as hopeless and incurable until these studies were begun and sufficient evidence is presented by many observers to warrant the statement that in fully 50 percent of cases the cause can be determined and successful treatment instituted.*

There is no difficulty in diagnosing an attack of bronchial asthma, so typical is the history and clinical picture of obstructed respiration, character of breathing, auscultatory signs, etc. Looking at the condition from the physiologic standpoint its etiology becomes apparent. A foreign protein, acting upon abnormally sensitive nerve fibres in the mucous membrane of the upper respiratory tract, through the nerve centers cause a spasm of the muscles of the large and small bronchi, resulting in a typical attack of bronchial asthma. The irritation may be confined to the nasal mucous membrane, causing typical suffusion, sneezing, burning, lachrymation and nasal discharge of so-called hay fever attack.

Differentiated from the typical bronchial asthma may be mentioned the so-called asthmatic bronchitis, due not to protein irritation but to bacterial infection, either direct or to the bacterial protein, engrafted usually upon a more or less chronic bronchial irritation, so-called cold or rhinitis. This type should be borne in mind and ruled out if results from protein therapy are to be expected.

Protein sensitiveness may be demonstrated by the intra-dermal test or the cutaneous test, with every argument, but especially that of safety, for the cutaneous method.

The flexor surface of the forearm is bared and cleansed. Small cuts are made with a sharp scalpel, deep enough to draw serum, but not to cause bleeding. On each cut is

placed a protein dissolved in a drop of 1-10 normal sodium hydroxide solution. A control upon which the hydroxide solution, but no protein is placed, is used for comparison.

In from ten minutes to half an hour the proteins are washed off and the reactions read. A positive reaction consists in the formation of a raised, urticarial wheal surrounding the cut which must measure 0.5 cm. or more in diameter. A wheal less than this in diameter is considered suspicious but not positive—and those larger are indicated as one, two or three plus.

Patients suffering from asthmatic bronchitis do not respond to the ordinary protein reaction though they may to the bacterial protein. A careful inquiry into the habits of the patient regarding diet should be made in case of a modified reaction or an entirely negative reaction. Certain articles of diet, which are eaten regularly, but sparingly eaten, may not cause evidences of allergy, but the eating of a large amount of the offending material may cause an attack.

Duke* reports food allergy as an occasional cause of abdominal pain. He reports cases in which intra-dermal skin test showed reactions to the same food which had apparently caused the abdominal pain on indigestion. With the pain were associated nausea and vomiting, and occasionally gaseous distension, diarrhea with mucus and less frequently purpura, edema and hives. Duke explains the pain and other symptoms as due to the allergy caused by contact between the sensitive gastro-intestinal mucosa and the food protein.

Many proteins have been isolated and are available for diagnostic purposes. The following are recommended specially to be used routinely: horsehair or dandruff; cat hair; feathers; the pollen of sunflower, rose, June grass, red top and ragweed; egg; milk; cereals; meats; chicken; potato. Our experience with the bacterial protein has not been satisfactory, although Walker and Goodale report ten per cent positive reactions in sixty patients suffering with asthma.

After the diagnosis of the offending protein the specific protein treatment should be employed, the endeavor being to desensitize or render the patient immune to the offending protein. In food idiosyncrasies, the omission of the food found as a cause or strongly suspected, as in the case of suspicious skin readings, is usually sufficient. Where

*Walker Oxford Looseleaf Medicine.

*Archives Internal Medicine, 28, 151, (Aug. 1921.)

there is bacterial, pollen or animal emanation protein irritation, the inoculation by subcutaneous injection of the offending protein should be recommended. The injections should always be controlled by skin tests of the strength of the solution to be injected. That is to say, if there is a reaction to 1 to 5,000 dilution, the first injection should be of a solution not stronger than 1-10,000.

The treatment should be begun sufficiently early in seasonal allergy to complete the course of treatment before the usual time of the attack. Otherwise serious anaphylaxis might result.

BASAL METABOLISM

The subject of endocrinology has been a most alluring one. There are, however, certain doubters. Dr. Cushing states:* "We find ourselves embarked on the fog bound and poorly charted sea of endocrinology. It is easy to lose our bearings for we have, most of us, little knowledge of seafaring and only a vague idea of our destination. Our motives are varied. Some unquestionably follow the lure of discovery; some are earnest colonizers; some have the spirit of missionaries, and would spread the gospel; some are attracted merely by the prospect of gain and are running full sail before the trade wind." Many other observers are optimists and judging by their writings are better seafarers than those referred to above.

Perhaps one reason for this difference of opinion is that no two persons suffering from endocrine disorders present the same symptoms, and the difficulty of recognizing in those cases of poly-glandular intoxication which endocrines predominate.

The thyroid gland has been more closely studied, perhaps, than any of the internal secretory glands. One of the main functions of the thyroid gland is to regulate the intensity of combustion in the body.* Two general functional disorders of this gland are recognized—hyperthyroidism, or Graves or Basedow's disease, and hypothyroidism or myxedema. In the former basal metabolism is increased; in the latter, it is decreased.

The patient which presents the typical symptoms of a thyrotoxicosis, the condition can be diagnosed by anyone, but there are few in whom all the cardinal symptoms are found. It is in those cases which present but few of the cardinal symptoms and which the general practitioner usually sees first and diagnoses as neurasthenia, that aids to the diagnosis must be used.

The symptoms which should be borne in

mind in the diagnosis of a case of thyrotoxicosis are persistent tachycardia, enlarged thyroid, fine tremor, exophthalmos, widening of the slits between the lids; this dissociation of the movements of the eye ball and those of the upper lid; inability to maintain convergence of the eyes; profuse sweating; watery and painless diarrhea; rapid and shallow respiration, weakness and other signs of myocardial degeneration; lymphocytosis, insomnia, loss of flesh with good appetite.

Thyrotoxicosis seems to exert its influence principally upon the autonomic nervous system, made up of the sympathetic system and the vagal autonomic system.

The Goetsch, or epinephrin test for determining thyrotoxicosis, is unstable and unreliable, as positive reactions are found in so many other conditions than thyrotoxicosis. Epinephrin solution is injected intramuscularly, and its effect upon the pulse rate, blood pressure, muscular tremor and subjective nervous symptoms are carefully noted over a given period of time.

In certain cases there is a predominance of the sympatheticotonia; in others, the vagatonia. In certain cases there is an involvement of both systems. In the patient presenting the mixed type of symptoms, the diagnosis is frequently in doubt and in these the determination of the basal metabolic rate is a most valuable diagnostic aid.

The chemical transformation of the products of digestion within the body, to its demands of nutrition, constitutes metabolism. Total metabolism may be expressed in terms of energy, and the heat unit, or large calorie, is commonly used for this purpose. The large calorie is the amount of heat required to raise one kilogram of water to one degree centigrade of temperature. Following the lead of Lavoisier, workers in this field of investigation have been able to develop the fact that heat production can be measured by the oxygen intake and carbon dioxide output, thus indirect calorimetry.*

Several types of respiratory apparatus are in use in indirect calorimetry; the closed circuit apparatus of the portable unit type, devised by Benedict; the smaller portable unit type of Jones, and the gastrometer type using Haldane method of gas analysis.

Basal metabolism is the heat production of an organism at complete muscular rest after a fasting period of 14 to 18 hours. The rates vary with age, sex, height, weight, food, muscular activity, temperature of patient, certain diseases, drugs, etc.

Disorders of the endocrine system effect the

**Journal A. M. A.*, Vol. 76, No. 25, P. 1721.

*Means: *Journal A. M. A.*, Vol. 77, No. 5.

*Basal Metabolism, John Walker Moore, *Ky. State Medical Journal*.

basal metabolism decidedly causing an increase or a decrease according to the glands effected. Involvement of the thyroid gland in which there is an increased activity and secretion, causes an increased rate with great regularity. Very severe cases show a plus 75 percent or more, severe cases plus 50 percent or more, and moderately severe cases show a plus 50 percent or less.

Englebach has shown that an involvement of the posterior lobe of the pituitary gland causes an increased metabolic rate. Fevers, carcinoma, pernicious anemia, cardiac diseases, lymphatic leukemia, pulmonary tuberculosis and certain drugs, such as thyroid extract, cafein, adrenalin, cause an increased rate.*

The estimation of the basal metabolic rate is a functional test of the thyroid gland and can be looked upon as a diagnostic aid of the greatest value. As McCaskey has demonstrated, in certain conditions, such as psychoneurotic disturbances and those presenting circulatory disturbances, as bradycardia, tachycardia, cardiac myasthenia, and certain arrhythmias, fine tremors, hyperidrosis, loss of weight, slight temperature disturbances and leucocytosis can be definitely differentiated from hyperthyroidism. Cases with symptoms of psychoneurotic instability and tachycardia, with or without thyroid enlargement, may be difficult to diagnose and a basal metabolic reading is of the greatest assistance. In highly nervous individuals, however, the first reading may show a slight increase, this being due to the muscular instability of a nervous person, rather than to a thyrotoxicosis. In these patients a second test should be made. Basal metabolism is of value also in diagnosing a simple obesity from an obesity of endocrine origin.

Readings between a minus eight to a plus ten per cent may be considered within normal limits.

Ill fitting mouth pieces, nose clamp, etc., has made it necessary for one of us (Dr. Moore) to invent a combination nose and mouth piece, which enables the patient to breathe with perfect freedom and great regularity. As the original mouthpiece and nose clip causes the patient to be much irritated, an increase in the reading of the basal rate often occurs.

Of what value, then, is the basal metabolic rate?

The diagnostic value of basal metabolism in endocrine disorders is no less important than its value in determining the proper method and outline of treatment. In brief, it may be said, in ductless glands disorders the basal

metabolic rate determines whether the method of treatment used has been beneficial, or of no value, or even harmful. For instance, in goitre therapy, it serves as no other means at our disposal in indicating the effect of certain lines of treatment. In management of hyperthyroidism, whether it be carried out by means of surgery, x-ray, or what not. It offers a definite means whereby the thyrotoxicosis can be measured from time to time, thus enabling the physician to direct more intelligently the proper line of treatment.

In hypothyroid cases, whether it be of a congenital or of a post-operative type, our line of thyroid feeding can be accurately determined by ascertaining from time to time the metabolic rate. In hypopituitarism it is of value in diagnosis and guiding treatment.

The question is often asked, is the metabolic rate a measure to the patient's ability to withstand thyroidectomy?

This question should be answered emphatically no. The rate gives information of the degree of thyroid intoxication, but in no way does it signify that the patient would be able to stand the superimposed stress of operation. We do know, as has been pointed out by Boothby, that the higher the metabolic rate, the greater the stress to which the patient is being subjected, and the greater the consequent reduction in his reserve power. He states as a general rule that preliminary ligations are less frequently indicated with patients having rates below plus 50 per cent, and very rarely with patients having rates below plus 40 per cent. We agree with this author that the mortality of thyroidectomy is lower in cases with basal metabolic rates below plus 50 per cent, but we do not feel that we can concur in the statement that preliminary ligation is mainly indicated in cases with rates below 40 per cent. If the mortality rate is reduced by preliminary ligation, why not ligate in all cases preliminary to thyroidectomy? It is found, not only in our series, but also in most all other reports, that there is a mortality rate in patients whose basal metabolic rate is below plus 40 per cent.

The basal rate does not tell us the duration of thyroid disorders, nor is it an index to myocardial degeneration. Thus, a patient in a state of remission may have a very slightly increased rate; but as a result of previous thyroid exacerbation, his myocardium might have suffered hypertrophy and degeneration with a marked reduction of reserve forces, even to the point of decompensation. It is obvious that in such a case the metabolic rate would not serve as an index for an operative risk. So we conclude that in cases with a rate below plus 40 per cent in which thyroid-

*Basal Metabolism. Dr. John Walker Moore. *Kentucky State Medical Journal*.

ectomy is contemplated, the decision should not rest upon the basal rate alone, but upon surgical judgment.

THE ROENTGEN RAYS

The roentgen rays offer us one of our most valuable aids in diagnosis. Physical findings are confirmed by them and often they reveal unsuspected pathology. By means of the rays the internist is able to locate various foci of infection, to verify the outlines of the heart and visualize various chest conditions, especially pleural effusions, pneumonias and tuberculosis. McGowan states: "In the diagnosis of tuberculosis in children, the roentgen ray is a most valuable and reliable evidence."* Rozenblattz writes: "It is commonly accepted that the roentgen-ray usually shows structural changes much earlier than physical examination, and in many cases where the physical examination is negative, the roentgenogram is positive."

With the aid of the fluoroscope, barium meal and enema one is able to demonstrate esophageal, gastric and intestinal pathology. With the fluoroscope, also, the size of the heart and aorta, the excursion of the diaphragm, mediastinal and lung conditions are usually clearly seen. By no other method is it possible to visualize suspected pathology.

By means of intra peritoneal injection of oxygen we are able to outline all abdominal and pelvic organs, viz: diaphragm, liver, spleen, kidneys, uterus, tubes and ovaries, and in conjunction with oxygen enema the colon is clearly shown. Adhesions to the diaphragm, adhesions of the intestinal coils to the parietal peritoneum, omental fixation, fibromyomata of the uterus, ovarian tumors, enlarged livers and gall bladders can be made out by the intraperitoneal oxygen injection. One of us, (Dr. Turner) in his work at the Louisville City Hospital, as yet unpublished, has not only been able to show the normal uterus, tubes and ovaries, but the gravid uterus, showing its gradual increase in size and appearance of fetal bones. Positive diagnosis of pregnancy has been made as early as three months. It has been found of service in certain doubtful cases to diagnose presentation and position.

Danby and others by intra-ventricular and intra-spinal injection of air have been able to demonstrate the cerebral ventricles, and by changed relations to localize intra-cranial neoplasms, and to differentiate the different forms of hydrocephalus.

Orendorf has reported rather important observations by means of direct peritonoscopy. By these direct observations within

the peritoneal cavity, he and others have been able to examine the under surface of the liver, gall bladder, peritoneum and female pelvic organs. The value of this direct examination over an exploratory laparotomy is evident.

The value of the ray to the orthopedist is paramount, for in no other way is he able to tell as accurately the position and severity of fractures, the results of his manipulations in bringing the fragments in correct apposition and alignment, and the various pathological bone conditions.

To the genito-urinary surgeon the ray offers the only positive evidence of renal calculi, and verifies his suspicion of ureteral and vesical calculi.

By the injection of certain solutions impenetrable by the rays, we are able to determine the extent of infection of the pelvis, of the kidney, vesical diverticulae, tumors, dilated and thickened ureters, etc.

FUNCTIONAL DIAGNOSIS OF THE HEART

William Harvey, writing in the seventeenth century, states that "the heart, consequently, is the beginning of life; the sun of Microcosm, even as the sun in his turn might well be designated the heart of the world; for it is the heart by whose virtue and pulse the blood is moved, perfected, made apt to nourish, and is preserved from corruption and coagulation; it is the household divinity which, discharging its function, nourishes, cherishes, quickens the whole body, and is indeed the foundation of life, the source of all action."

Perfect functioning of the heart would imply a state in which all the qualities of the cardiac structure are normal and coordinate. If there is any derangement of the qualities, the question is then asked, to what degree does the disturbance effect the efficiency of the whole organ?

The recognition and significance of cardiac disorders can usually be arrived at by clinical study combined with the use of various technical methods.

The clinical symptoms and physical signs, though of utmost importance in the study of cardiac conditions, probably do not indicate the exact level of cardiac efficiency. It is for this reason that technical methods as the sphygmograph, polygraph and electrocardiograph have proven themselves valuable aids.

POLYGRAPH

It must be admitted that a wonderful advance in cardiovascular diagnosis has come through the use of such instruments as the polygraph and the electrocardiograph.

Long before the electrocardiograph had been

*British Journal Tuberculosis, Vol. 12, No. 4, October 18.

perfected, workers, as McKenzie, with the polygraph, showed characteristic variation of the a, c and v waves, which made it possible to interpret definitely the various cardiac arrhythmias.

That the "a" represents the beginning of auricular systole; the "c," the beginning of ventricular contraction, and the drop of the "v" wave, the opening of the tricuspid valves, cannot be denied, even in the light of the electrocardiograph findings. The polygraph, therefore, is invaluable in diagnosing the various cardiac arrhythmias, and owing to the compactness of its mechanism, and the simplicity of its manipulation, the physician is no longer justified in saying that this or that patient has a cardiac arrhythmia without determining its type.

ELECTROCARDIOGRAPH

The electrocardiograph may be said to be in its infancy. Nevertheless, workers with this instrument of precision, have brought to light many invaluable phenomena taking place during the cardiac actions. Not only can the various types of arrhythmias be accurately established, but the preponderance of one ventricle over the other, when present, is almost always clearly depicted. Special emphasis should be laid upon the electrocardiographic changes that are associated with myocardial involvement. Such conditions as bundle branch block and arborization block, may be shown in an electrocardiogram long before any serious clinical symptoms have developed.

The results of the study of the cardiac impulse along with x-ray and post mortem findings are promising,—nevertheless, much data is yet necessary to make this field a useful adjunct in cardiac diagnosis.

Of the less technical methods may be classed blood pressure and muscular efficiency tests.

The value of the former method is familiar to all of us, and will not be dwelled upon. Of the latter, many methods as hopping, climbing steps, walking up inclines, dumb bell exercises, etc., have been advocated. While any one of these methods are valuable aids in testing the cardiac reserve power, in a beginning stage of weakened myocardium, nevertheless, they fall short of their purposes in the advanced stages of myocardial insufficiencies.

GALL BLADDER DRAINAGE

Direct drainage of the gall bladder by the Lyon Meltzer method is one of the distinct advances in the diagnosis and treatment of disease of the gall bladder and ducts. Meltzer's suggestion that magnesium sulphate so-

lution injected directly into the duodenum has the effect of relaxing the common duct sphincter and causing a contraction of the gall bladder, thus emptying it of its contents,—Lyon proved clinically. Lyon states: "We can make a differential diagnosis between cholecystitis, choledochiasis, and choledochitis in a more scientific manner than by any other method yet advanced."

With the patient fasting for twelve or fourteen hours, a duodenal tube with metal tip is swallowed, the stomach contents aspirated and the patient swallows the tube to the third marking. The patient laying on the right side, the tip passes into the duodenum in fifteen to twenty minutes, evidenced by the tug and the character of the fluid aspirated. This aspiration may be done by the vacuum bottle or by the syringe. The first fluid is usually bile free and of syrupy consistence. Seventy-five c. c. of a twenty-five per cent solution of magnesium sulphate is injected through the tube or allowed to flow by gravity. Lyon describes the fluid obtained, first from the common duct, light in color, second, from the gall bladder, thick and dark, third, from the liver itself, clear lemon yellow.

Repeated drainage by this method has been found most beneficial in a number of conditions, so-called "biliousness," recurrent headaches with nausea, chronic indigestion with attacks of colic, chronic constipation, catarrhal jaundice, gall stones, etc.

DISCUSSION:

E. B. Bradley, Lexington: I arrived after Dr. Tuley had begun his paper, but I was in time to hear the most important part of it. It seems to me, Dr. Tuley has given a wonderful summary of the newer methods, the diagnostic aids, and no doubt he would have gone into the subject further if he had been given more time.

There is no question, of course, as to the value of the laboratory in helping to make a diagnosis; the value of basal metabolism, the value of functional kidney tests, and the value of various other tests in differentiating different types of disease. But the most important part of the paper, and the part that ought to appeal to all of us, is the one with which he started, that is, the history of the patient. How many cases can any of you doctors remember—and I have no doubt many of you can remember quite a number—where if a more careful history had been taken the diagnosis might have been arrived at sooner or much more accurately. I think all of us get in a hurry taking a history, and we are too prone to rely on the aid of the laboratory, basal metabolism, or blood chemistry for a diagnosis. It has been emphasized for many years how valuable a history is in cases of tuberculosis

of the lungs. Every doctor is able to take a careful history of the case to find out what the patient has complained of, what has happened to the patient, what symptoms the patient has shown over a certain length of time.

If he is willing to take time to do this in cases of beginning tuberculosis of the lung, the diagnosis not infrequently can be arrived at as early as can be done by an examination with the X-ray, the sputum, or by any of the other newer methods. The same is true in practically all classes of cases. I remember two or three cases that came under my observation in which, if I had had a better history, I would have made a better diagnosis. It is the doctor's fault that he does not obtain the right sort of history.

Not long ago I was called to see an old lady who complained of a great deal of pain in her right side. The pain was located in the right iliac fossa or a little higher. She gave a history of having had difficulty in having her bowels to move for some time; she had lost weight; she had had two or three such attacks of pain. She had a slight temperature, and practically no leukocytosis. Her daughter, who was a trained nurse, gave us the fact that on the day before and really before the pain became severe she had passed a very large amount of urine at one time. In spite of that, we failed to make a diagnosis. A surgeon thought she had a distended gall-bladder. I thought she had carcinoma of the intestine, but what she had was a hydronephrosis, the kidney was very much enlarged. On going further into the history after the operation we found that she had had in the past two other attacks and in each had passed a very large amount of urine at one time.

A doctor had an enormous tumor in the abdomen on the left side. Every physician who examined him in Lexington and at Johns Hopkins diagnosed this as enlargement of the spleen. Of course leukemia was ruled out by blood examination. He was operated upon and the tumor was found to be hypernephroma. After operation upon going into the history more fully it was found that he had passed bloody urine on several occasions, but this had never been mentioned in his history. The patient himself was a well trained medical man, and this instance is cited to show how easily an important fact in a history may be overlooked.

We could multiply other instances of the same kind where if we had gotten the proper sort of history and had pursued the case to the logical end, we could have made our diagnosis earlier than if we had depended upon laboratory aid.

It is not my purpose to undervalue basal metabolism, blood chemistry, or blood analysis. Of course, these things are brought to our attention constantly, and I think we are all beginning to realize how much we owe to the laboratory; but do we in realizing this, attach the importance

that we should to the careful history of the patient, as well as a good physical examination, for after all they are the two most valuable diagnostic aids, and they are things that every one can do whether close to a laboratory or to an X-ray machine, or what not.

Leon L. Solomon, Louisville: Whatever else may be said today, as we enter the discussion of medical papers in this convention, we are aware of the fact, that more attention is being constantly paid to "Aids in Diagnosis."

In the very comprehensive paper of Dr. Tuley's, which it has been my privilege to read in its entirety, and which he was not permitted to read, in full before this assembly, he has most thoroughly and painstakingly gone into the various phases of diagnosis and the "aids to diagnosis," laying no more emphasis on one, than on the other means to reach the conclusion. You have heard that part of his paper, in which he called attention, first, to the necessity for getting a complete history and, second, to the necessity for making a careful physical examination. For lack of time, the essayist was not permitted to go deeply into the laboratory part of his paper.

Think of the privileges of those, who live today, in comparison with the medical man of fifty or a hundred years ago. Imagine the difficulties that must have beset him. Is it not then a privilege to live in this period of scientific research, where diagnosis rests upon a firmer foundation, than ever before in the history of medicine. We no longer decry the advantages and revelations of the laboratory, but proclaim them. Those of us, who can look back twenty-five years or more, know that there were then men, who were insistent, that there was no such thing as the "Germ Theory of Disease." How well do I recall that most lovable, keen witted man, a superb clinician, a splendid internist and a skilled surgeon, Dr. J. M. Holloway, who insisted, in my day and time, that there was no such thing as the "Germ Theory of Disease." Boldly walking up and down the assembly hall, he would decry the fellow, who dared talk about germs, "Bugs," as he called them. Holloway and Yandell, almost coming to blows on this and other questions, with that sweet fellow, Roberts, acting as peacemaker. All of these men have gone into the Great Beyond, and when we stop to think of their difficulties, because of lack of laboratory facilities, we can realize what Austin Flint and other men of his type were able to do for us, despite the fact, that the laboratory was unknown to them. It was they, who described the "sputum rotundum," leaving the mouth, striking the cuspidor and sinking immediately to the bottom. Sputum rotundum was clinically characteristic of the tuberculosis patient. Why? Because to be round and to be heavy enough to sink, it must be laden with elastic tissue and other debris, giving it weight. Theirs was the day of close bedside

study of the patient, and what they lacked in knowledge of the laboratory, was compensated, in a measure, by a scrutinizing clinical study. If we, today, paid the same attention to physical diagnosis, as did those men, what an advance there would be. But, as has been truly said, we have gotten away from the clinical and we are lazy about history taking. Unfortunately, too many of us depend upon the laboratory to make the diagnosis for us.

A splendid paper, along this particular line, was presented only the other evening by Dr. Baldanf, himself a laboratory worker and a competent clinician. One of the gentlemen who discussed the paper (Dr. Boggess) asked Dr. Keith how often the diagnosis of tuberculosis was referred to the X-ray room, in plain easy cases, when a correct conclusion might readily have been reached, even by a tyro in medicine, who had learned inspection, palpation, percussion, and auscultation. As to the laboratory aids to diagnosis, even the man in the smallest community has them near at hand. Diagnostic laboratories are everywhere within easy reach. The most modest practitioner has at his disposal the opportunity of reaching conclusions, just as dependable as the more skillful. Application to the task, however, is essential. Such modest practitioner must be willing to devote the necessary time and diligence to the carefully taken history; he must be willing to undertake the careful physical. These two requirements, once satisfied, he can, if he will, either do some of the laboratory work himself, referring the balance, or he may have it all done, through some of his professional friends, whose laboratories are at general disposal.

Curran Pope, Louisville: I wish to heartily subscribe to the paper and to all that has been said with regard to the history taking, to the laboratory work, and otherwise. But I think there is an exceeding advantage, in addition to all that has been said in trying to get a chronological history of the patient. I personally am essentially a visualist, and when a case presents itself to me I try to visualize that patient from birth to the inception of the malady and see the case through the malady up to the time the case consults me. I try to place that case in my vision as clearly as I can, and I believe that much is gained in history taking by a careful chronological investigation of the individual. It is but reiteration to say that many a mistake would not have been made if the doctor had not either been too ashamed or too tired, or too something, to put his hands upon the patient. I think one of the reasons why we suffer from the affliction of pathies and cults, so-called medical cults, is due to the fact that so-called medical dignity does not permit of a learned man putting his hands in a manipulative way upon a patient. In the near future I think all of that will be swept

away and more liberal activity of the physician with his patient.

Now, why draw invidious comparisons between history taking, between the physical examination and the laboratory? They are three brothers, nothing else. We cannot compare them because you cannot measure liquids with a dry measure, nor can you measure cloth by the quart, but each one must be measured and emphasized and appreciated by its own particular yardstick. Each has its particular niche, each has its particular place, each has its particular chronological position in the study of a case, and I am going to ask how many men in their practice, whether they be general practitioners or specialists, actually reduce to writing their conclusions about a case that comes before them for study. It is my universal habit to do this because I believe by reducing my conclusions to writing, I am perforce compelled to clarify my own intellect, to drop, so to speak, the lump of medical alum into the psychic bucket of water, in order that that muddy and indistinct and hazardous condition of mind may be clarified and rendered more clear. I have a regular summary blank for each and every function and each and every organ of the human body. If we reduce our conclusions to writing, we would get a point of view which we would not otherwise get. If you do not think reducing your conclusions to writing is a valuable thing, take hold of something you are not clear upon, and then put it down in cold black and white and you will find out the difference.

One word about pollenosis. In treatment especially valuable are ragweed and golden rod and blue grass of this state, particularly blue grass. In New York State they have no need for golden rod and blue grass, but in Kentucky and up in the blue grass region, the men who are doing this work should have pollen composed of the protein of the blue grass.

R. A. Bate, Louisville: This is a wonderful age. It is a great pleasure to be able to prove today men's thoughts. Dr. Lyfan, of Chicago, in the American Textbook on Practice, 1894, in an article entitled "Acid Dyscrasia," practically foretold all that has been proven in the paper today. Sajons has gone further and in his endocrinology maintained what will be repeated thirty years hence. All these things were foretold practically and made plain when the laboratory proof was not there.

What is this anaphylaxis we hear about so much? It is explained by Sajons in his endocrinological discussion. In other words, there is a lack of harmony on the part of the internal secretions, and I insist that those gentlemen who have not so far accepted the doctrine of endocrinology should at least investigate it.

J. Rowan Morrison, Louisville: I was glad indeed to hear this splendid paper by Dr. Tuley. I

thoroughly approve of what he said with reference to aids to diagnosis in so far that if we think about these things, if we take our patients and analyze them along the lines he has brought out, taking careful histories and making a thorough physical examination, we will make more accurate diagnoses than we have done in the past, and if we are thorough and painstaking we will be able to interpret correctly our findings.

George P. Sprague, Lexington: It seems to me, this paper of Dr. Tuley's is one of the most important this Association can have at this or any other session.

As to the special diagnostic aids; if the practitioner will bear in mind that he is not dealing with a disease but with a sick individual, it will make him learn all there is to know about his patient. I would like to appeal to the younger men especially by saying that if they will do that, they will find that the paths now worn to the centers of medical teaching will become grass grown. There are potential Mayos in every section of the State of Kentucky; men with just as great natural ability as have our leaders with national and international reputations, and if they would but do what Dr. Tuley's paper makes most prominent—study their cases, learn all there is to learn about the particular individual and apply their learning, they would be much more successful. All that is needed to make us great physicians and enable us to cure our patients is to put into use what Dr. Tuley has here outlined.

Henry Enos Tuley, Louisville, (closing): I have nothing further to add except to thank the gentlemen for their very liberal discussion.

Determination of Diffusible Calcium in Serum.

—The diffusible calcium of the serum of normal men and dogs was found by von Meysenbug and his associates to comprise from 60 to 70 per cent. of the total serum calcium. Varying the carbon dioxide saturation of the serum between 17 mm. mercury tension and 62 mm. does not alter this percentage. The authors have devised a method of dialyzing serum against a buffer solution of the Ringer type, at the same time maintaining a constant carbon dioxide tension in the dialyzing system.

Exophthalmic Goiter in Pregnancy.—In the case described the exophthalmic goiter had developed in the course of the pregnancy, and the condition became very grave at the sixth month, the woman not being able to obtain a moment of rest, the dyspnea extreme, and the pulse 180, the condition growing worse under repose, bromids and antithyroid treatment. Evacuation of the uterus was followed by retrogression of the clinical picture. In a few days symptoms had been so much improved that she left for home. The further outcome is not known.

PERICARDITIS: PNEUMONIA: CASE REPORT.*

By **JOHN W. MOORE**, B. S., Louisville.

This patient, a colored girl, aged six years, I first saw in the hospital ward yesterday. She was admitted with the history that one month ago she had tonsillitis and was sent home from school. The following day a physician was called and found she had a very much inflamed throat and a few rales scattered throughout the chest, and he thought probably the child had pneumonia.

Two weeks later she was sent to the hospital, and at that time the diagnosis of pericarditis was made in the ward. Undoubtedly the patient had pericarditis at that time, and of course she still has it. Her temperature at no time has exceeded 101° F.; at times it has been 98° F.; each day it is high in the afternoon, and lower at night.

On examining her chest yesterday, I found there was some consolidation. There was dulness over the upper two-thirds of the lung. This afternoon I made a puncture of the pleura and withdraw a small amount of fluid.

One reason for bringing this patient before you is that we have had in the hospital during the last month and a half three or four cases of pericarditis. This child has had a very rapid respiration ever since she has been in the hospital. Her pulse has also been rapid. She has been more comfortable since withdrawal of 8 c. c. of fluid from the pleural cavity. The child evidently had pneumonia prior to the development of the empyema. She probably also had effusion into the pericardium after the pneumonia developed. She had both a systolic and diastolic murmur at the apex transmitted to the axilla.

DISCUSSION:

Sidney J. Meyers: The physical signs in this case are most interesting. The child undoubtedly has pneumonia, there being dulness over the upper portion of the lung which can be plainly outlined by auscultation and percussion, and in the lower lobe there is flatness instead of dulness. There are no breath sounds, showing there is an accumulation of fluid. She undoubtedly has a precordial rub which can be demonstrated when she holds her breath for a moment.

J. R. Peabody: An interesting feature in the case reported is that the child gives the history of tonsillitis. I believe all her troubles could have been prevented by removal of her tonsils in the beginning. I am led to make this remark

*Clinical report with exhibition of patient before the Louisville Medico-Chirurgical Society, May, 13th, 1921.

by several cases which came under my observation in military practice.

I have become very radical on the question of tonsil removal. I began studying this question critically about eight years ago, and believed even then that all infected tonsils ought to be removed. However, it was the custom in those days to perform the old-fashioned tonsillotomy instead of tonsillectomy.

The fact that many indefinite symptoms are relieved by tonsillectomy has made me feel very radical about this question. In the army many young soldiers were sent to the hospital with tonsillitis. Where the tonsils were not removed very often they returned with evidences of pneumonia, pleuritis, pericarditis, etc., and some resulted fatally. This made me feel that certainly after one attack of tonsillitis, the tonsils ought to be removed.

I believe tonsillectomy should have been performed in the case reported.

Sidney J. Meyers: I want to speak to one point only: My experience has been augmented during the past winter by having seen quite a few fatal cases of endocarditis resulting from one attack of tonsillitis. The impression made upon me, without going into the subject deeper than that, is: that the cases of cardiac complications following tonsillitis are very much akin to the nerve symptoms following syphilis. That is to say, they do not follow acute, virulent tonsillitis, but as a rule, according to the history obtained in many of the cases, the patient merely had a sore throat, perhaps not sufficiently severe to necessitate going to bed, in some cases the symptoms were so mild as to hardly justify calling the family physician. In this respect the cases resembled the syphilis sometimes seen which is so mild that the disease remains unrecognized and untreated. Nevertheless, following such an attack, extensive involvement of the nervous system may supervene.

I saw yesterday a patient who died of endocarditis and edema of the lung following a mild attack of sore throat. I saw today a case of exactly the same nature and the child is going to die. She has an enlarged heart and all of the usual phenomena are present. Rest and the customary treatment have availed nothing. So it is not always the cases that are untreated which give us the most dangerous complications.

I agree with Dr. Peabody that after one attack of tonsillitis, if symptoms continue, tonsillectomy is indicated.

S. G. Dabney: Many of us have changed our minds about a variety of things during the last eight years. No doubt many tonsils are removed which should have been left; but on the whole I am inclined to agree that perhaps it is a wise plan to remove a tonsil which examination shows might be safely left, rather than to

leave one that might give rise to serious trouble later.

The subject of focal infection is an extensive one and is of great interest. I sometimes think the profession is prone to follow a fad too far. I happened to see a lady yesterday who complained especially of headache and dizziness. She seemed easily distressed and gave me the impression of being worried. She had been under the care of another practitioner who had treated her nose, tonsils, sinuses, etc. She told me that she had been in great family trouble and it had preyed upon her mind tremendously. My impression of her case was that her symptoms were not due to infected tonsils, teeth or sinuses, but were chiefly psychical. All the upper teeth had been removed with no result.

I have seen a number of such cases where the teeth have been extracted, tonsils removed, sinuses operated upon, etc., when there was some care or worry that caused the patient's distress, and this could have been discovered if the doctor had made diligent search. I do not believe such cases are very rare.

As to Dr. Meyers' comparison between mild syphilis and mild tonsillitis. It has been my understanding that it is not especially the mild cases of syphilis which are followed by sequelae, nervous manifestations, locomotor ataxia, etc., but it is because these patients were not properly treated. The point was emphasized by Fournier many years ago. Every man in the practice of medicine sees patients with syphilis. I have often wondered how many of them ask the patient what sort of treatment he had in the beginning. I always do, and, moreover, examine the patient carefully as to the promptness, method and duration of treatment.

I saw a patient in consultation with one of my colleagues last week with a tumor of the soft palate. I asked the patient how long he had been treated for his original syphilis, and he replied, "about three months." I have received this answer time and time again. Practically this amounts to no treatment.

I am inclined on the whole to agree with Dr. Peabody about tonsillectomy, although it is undoubtedly true that many tonsils have been removed unnecessarily. I do not believe the practice of tonsillectomy is as pernicious as the extraction of teeth without reason. I am sure many patients have had their teeth extracted unnecessarily under the belief that they were foci of infection. While it is quite true that the teeth may be foci of infection, I do not believe the x-ray picture can be implicitly relied on to establish the relation between the symptoms and diseases of the teeth. There is much in the question of focal infection from diseased teeth, but we should not become extremists on the subject.

Louis Frank: I am particularly impressed

with the remark made by Dr. Peabody that this child should have had her tonsils removed and thus avoided the disease which she now presents. Simply because an individual is liable to certain diseases is certainly no indication for the removal of any organ fearing that it may in the future bring on that ailment. This child may have had diseased tonsils, or she may not; but to remove tonsils simply to avoid what may happen in the future is absolutely unjustifiable. While the importance of the tonsils and teeth as possible foci of infection has not been in the least exaggerated, there are men everywhere who simply look upon teeth and tonsils as sources of every disease to which human beings may fall heir. If they cannot find anything else wrong, they immediately conclude that the teeth or tonsils are responsible and remove them.

I have recently had under my care a woman who had "gone the rounds," so to speak, complaining of vague symptoms. Her teeth and tonsils had been removed and she still complained. Examination revealed two chronic pus-tubes which were removed. I do not know whether she will be cured by this operation, but certainly in this case the infection did not originate in either the teeth or tonsils. Cases of this kind are seen almost daily. Too often the patient is merely inspected and then referred to the dentist, the radiologist, the laryngologist, etc., for examination. No one thinks to examine the ureters, the kidneys or the bladder, and as a result a great many foci of infection are overlooked. The surgeon is usually the last one to see such patients; they go to him after the teeth and tonsils have been removed and no benefit obtained. I do not know how many patients of that kind I have seen during the last eighteen months. I have two in the hospital now, and in each of these the teeth and tonsils have been removed without benefit. In neither could the trouble be traced to the teeth or tonsils. They are now pulling the teeth of women to cure cancer of the breast; they are removing tonsils to cure uterine fibroids. The conditions remind me of abdominal surgery early in its history, when hundreds of ovaries were removed simply because they contained a few small cysts. In the majority of instances the ovaries were perfectly normal. Of course, there can be no question that diseased tonsils and diseased teeth should be removed, but the point I want to make is that it is unjustifiable to remove the tonsils and teeth fearing they may in the future be the foci of infection. The patient should be subjected to thorough examination to determine the focus of infection, if one exists, before condemning either the teeth or tonsils. There are now men in every city and even in small villages claiming to represent a new school of specialists; they are men without experience; men who have had no especial training along

special lines. They see these things in medical journals and hear them discussed before medical societies; they examine the tonsils and claim to find evidence of disease, and tonsillectomy is performed. If the symptoms continue, they examine the teeth with a small x-ray machine and remove them.

We must use judgment in what we recommend to our patients. If the tonsils are found diseased of course they should be removed. The fact that it does the individual no harm is not sufficient excuse for removing tonsils that do not require removal. We might with equal propriety advise hysterectomy for every woman who has given birth to a child, or remove the breast of every woman who has a small nodule for fear of the development of malignancy. Such surgery is on a par with the removal of the healthy appendix of every baby at the age of eight months or a year for fear of future appendicitis.

In my opinion the tonsils and teeth have been erroneously blamed for many things; that is, the teeth and tonsils have been needlessly sacrificed in thousands of cases. I do not believe they are as frequently the foci of infection as we have been led to infer. The profession has accepted the teachings of Billings and others too literally and have followed their views blindly and without reason.

J. R. Peabody: I do not want to leave the impression that I am of the opinion every tonsil should be removed. However, when a man practices in his own family what he preaches in public, he may be regarded as entirely sincere in his beliefs. One of my boys has been operated upon and his tonsils removed; the other one will be subjected to a similar operation this summer. He has adenoids and when these are removed tonsillectomy will also be performed.

In the case before us probably if the child had been properly examined diseased tonsils would have been discovered. However, it is sometimes difficult in children to determine whether the tonsil is diseased or not. In adults it is easier. In adults when the tonsils can be seen on examination, or the crypts are fairly large, removal is indicated if there are any symptoms of focal infection. Nature intended the tonsils to disappear. I feel so strongly about this that I am going to subject myself to tonsillectomy.

Last night I had the pleasure of reading a paper before another society on the relation of diseases of the nose and throat to ear affections. I made a rather strong plea for tonsillectomy and no one present took issue with me. They all agreed that adenoids and tonsils were more frequent factors in the development of ear diseases than the nose. The influence of nasal deformities in the production of ear diseases has been very much exaggerated. They used to think it necessary to correct slight septal deviations,

but now we know better and septal deformities which do not cause obstruction are allowed to remain as they are.

It is undoubtedly true that many healthy tonsils have been sacrificed, but I still claim that the patient suffered no harm from their removal. Only today I saw in my clinic at the hospital a gentleman seventy-six years of age whose tonsils should have been removed long ago. He had chronic so-called non-suppurative otitis media and was almost totally deaf. I believe in this case the trouble originated in the tonsils and deafness might have been prevented by their removal.

I have under observation a woman aged 42 years whose tonsils I expect to remove tomorrow. She was referred to me by a gastroenterologist with the suggestion that her tonsils be carefully examined. Not finding anything wrong with her tonsils on inspection she was told to return to her physician for treatment. I was surprised that the stomach specialist again referred the patient to me with the request that her tonsils be more carefully examined. This was done with the result that several large masses of thickened secretion were expressed from the tonsillar crypts. These were overlooked during my first examination. I believe the woman's symptoms will be relieved by tonsillectomy.

Leon K. Baldauf: I do not know what the trend of opinion here is in regard to focal infection, and I am not old enough to review the history of medicine; but I believe within ten or fifteen years when we begin to look backward we will find that the study of focal infections is one of the biggest things in medicine. The results which have been obtained by the removal of abscessed teeth and diseased tonsils have been perfectly marvelous in some cases. Whether all devitalized teeth should be removed is a big question which has not yet been definitely settled. There is no question that where symptoms arise from diseased teeth, and especially where roentgen-ray examination shows the presence of definite granulomata, the teeth should be extracted. I have seen the most wonderful results from the removal of one diseased tooth, and these results were obtained in a very short time.

Not long ago I had the pleasure of hearing Lucas, from Indianapolis, who has been doing such a great deal of research work in connection with the teeth, deliver the principal address before the Kentucky Dental Society. He said that he was formerly under the impression that he could perform successfully what he called "apicectomy" in case of abscess at the root and thus preserve the tooth. Latterly, however, he had not only abandoned that idea but he was under the impression that all devitalized teeth should be removed. If a tooth is abscessed I believe we are all agreed that it should be extracted,

but the question of removal of a devitalized tooth is an entirely different matter.

The whole trouble about focal infection is that we are constantly looking for disease of the teeth and tonsils, forgetting all other parts of the body where foci of infection may exist. During the last few weeks I have had several cases where the focus of infection was located in the prostate. Applications of nitrate of silver were made through the endoscope and massage given, and the symptoms disappeared after a few days. Foci of infection may exist in the abdominal cavity, the gall bladder and appendix being the most frequent sites. The possibility of a focus of infection located elsewhere than in the teeth or tonsils should not be overlooked.

Another question arises in connection with the case before us, that is, the presence of endocarditis. Should the tonsils be removed after the heart valves are involved? I think they ought. This is a very large question. I have recently read Sir James Mackenzie's latest article on angina pectoris. I had a very interesting case of angina four or five weeks ago in the person of a Louisville physician. He had typical anginal attacks, sometimes two or three a day. He was a German and could not be kept from eating with difficulty. He was kept on a diet for a while but the angina attacks were not relieved. He finally went to another doctor who had sufficient foresight to carefully examine his mouth. He found several abscessed teeth—teeth that were abscessed down to the gums. These teeth were extracted and the "epidemic" of anginal attacks disappeared. I do not mean to say that his angina is cured. He has an organic heart lesion, but if he takes proper care of himself and does not get excited, he will probably be relieved. Mackenzie and I believe Friedenwald also takes the position that even though the heart muscle or the heart valves are involved, these irritative foci ought to be removed.

While I do not pretend to know anything about the tonsils or teeth, the big question has not yet been settled. Everybody agrees that abscessed teeth ought to be extracted, but the question to be decided is whether all devitalized teeth should also be removed. The man from Indianapolis, whom I have mentioned, and who has done some wonderful work along these lines, has made very careful microscopic and bacteriologic examinations of dead teeth, and has found pure cultures of streptococci and staphylococci at the roots of devitalized teeth.

Pyorrhea alveolaris must also be considered when studying foci of infection. The margins of the gums furnish a large surface for the absorption of infective material. The cure of pyorrhea has been productive of wonderful results in certain cases of focal infection.

PENETRATING WOUNDS OF THE EYE BALL.*

By CHAS. W. REYNOLDS, Covington.

Penetrating wounds of the eye ball constitute one of the most important lines of cases presented to the oculist for his consideration, by reason of the attendant symptoms and dangers that present themselves.

The poet has said, "To be or not to be! That is the question." The oculist might well change this to "To see or not to see! That is the question?"

Penetrating wounds of the eye ball may involve the cornea, the sclera, or both, with the underlying tissues and by reason of their delicate construction, the wounding of these structures is often attended with the direct consequences, if not to life, then to the eyesight of the unfortunate victim of the accident that has produced the train of consequences that follow in its wake.

Wounds made by foreign substances may or may not be sterile per se, and yet be infected from the surrounding structures, leading to all the results of inflammation.

Wounds made by surgical instruments, properly sterilized may also have unfortunate sequelae by reason of inability to properly sterilize the site of the operation.

The case may be unfortunately situated so that prompt aid cannot be given, and if given, there may be some fault in the technique that may result disastrously.

It is this threatened loss of eyesight, which has been thus far hinted that should move us all to look into this subject with the utmost care, lest blindness to our patients shall ensue as a result of our unpreparedness.

Penetrating wounds of the eye will be divided firstly into those of the cornea; then into those involving the sclera and cornea, and lastly in those involving the sclera. Of course with the latter two groups will be considered those involving the underlying structures.

Penetrating wounds will be divided into the incised, punctured, and lacerated wounds.

Incised wounds are made by a sharp cutting body, as a knife, thin sharp cutting pieces of metal, slivers of glass, which cut smoothly and then have a tendency to close.

Punctured wounds, are those that push their way through the coats of the eye, leaving a more or less round opening permitting of the escape of the contents of the eye, until plugged up.

Rupture of the eye ball, usually the scleral coat, leaves a lacerated wound.

Penetrating wounds of the eyeball are followed by almost immediate reduction in eye ball tension, the degree depending upon the amount of either aqueous or vitreous humor lost.

Small wounds of the cornea, of the incised type, may close almost immediately after the wound has been made; still the anterior chamber will be found to have less depth than has its fellow—the uninjured eye. A little pressure on the cornea, will result in a still further flow of aqueous humor. If the wound is quite extensive, or the loss of the aqueous humor has been sufficient to allow the iris to come close to the wound, the iris may be found to have become incarcerated, and considerable fluid may have escaped externally.

When the coat of the eye has been perforated, the question arises, is there a foreign body within the eye? This question must be decided and decided at once, if possible, as upon the decision may hinge the success of the ensuing treatment. When the inflicting instrument is considered, a sharp knife, or bit of metal, that can be seen, or when the object that inflicted the injury is found to be intact, the question is quite easily answered. When the inflicting cause has not been found by ocular examination, some data may be found by means of an x-ray examination. An x-ray also has its limitations.

In some cases the foreign body may pass through the cornea, iris, suspensory body and be found in the vitreous, where it will set up trouble in most cases unless removed forthwith.

The injury becomes more serious the further back it involves the structures of the eye ball. The aqueous humor may be almost all lost, and yet when the wound is closed, the humor will reaccumulate and vision be restored to normal.

This is not the case when the vitreous humor is in great part lost, for with its loss, there is more or less disorganization of the delicate structures of the eye, with consequent impairment or loss of vision.

Not only may the vitreous be lost, in part or in whole, but the uveal tract may prolapse into the wound to such a degree, as to prevent the proper closure of the scleral wound, giving rise to a crystal condition which will give rise to subsequent trouble, not only with the injured eye, but also in the uninjured one by sympathetic disturbance.

In some cases it will be found that the lens, is either dislocated, or else even forced out through the wound, producing a distorted vision, even if the eye ball does not break down in inflammatory changes.

Accompanying this loss of the vitreous hu-

*Read before the Campbell-Kenton County Medical Society.

mor, there may be more or less stripping of the retina from its attachment, this detachment being either produced by the penetrating body, or else the presence of hemorrhage, or by subsequent inflammatory changes.

When it is considered how delicate is the structure of the retina, and how finely must it be focused, so that rays of a light coming from a distance must be centered on it, it is not surprising how a slight disturbance of its normal position will result in impaired vision.

Very few eyes can stand the presence of a foreign body in the eye, be this foreign body ever so small. In most cases, this foreign body gives rise to various degrees of irritability, sometimes leading to complete destruction of the eyeball by panophthalmitis.

Still in view of these unfortunate cases there are cases on record where a foreign body has been carried in the eye for years with no untoward results. Yet one is not warranted in stating that such a fortunate result will ensue in any particular case, as the chances are just the reverse.

The foreign body may be aseptic, yet by reason of the action of the foreign body on the tissues surrounding it, there may be produced irritative compounds, which will result in the production of an inflammation that will cause a destruction of the eye ball. Bits of copper and mercury, introduced experimentally into the anterior chamber has caused inflammatory changes to take place.

Again, the foreign body may have been removed, the wound apparently healed, yet the eye be subsequently lost, through a chronic inflammation resulting from a tightening of the scar tissue, or the presence of incarcerated bits of the uveal tract.

Then again the location of the injury must be taken in consideration if a probable result is desired when the patient's friends inquire as to whether the eye will ever see again. A guarded reply should always be given. Wounds of the cornea, as a rule are more prone to favorable results than are injuries to the iris and ciliary body and sclera, as violent inflammation results whenever the wound of the interior of the eye has been infected. The interior of the eye is an ideal place for the growth of different kinds of germs, the inflammatory process affecting mainly the uveal tract. In the acute cases, the process is purulent, affecting the whole eye, panophthalmitis, while in the less acute, the exudate is more plastic, which exudate becomes organized into a false membrane, which further organizes and contracts, gradually causing a contraction of the eye ball, an atrophy, which destroys the eyesight. This outcome of the case is more dangerous than the acute purulent form which seldom causes a sympathetic

inflammation of the other eye, as is the case in the plastic forms of the trouble.

As already stated, the ultimate outcome of the case is one to be viewed with concern. The prognosis should be very guardedly stated.

The treatment should be very carefully carried out. Even then very unfortunate termination cannot be avoided.

Naturally, if a foreign body is in the eye, a reasonable attempt should be made to extract the same, if the case is seen at once. If any time has been allowed to elapse, and the wound is already inflamed, then the foreign body may have to be extracted through a new incision.

Rest in bed, with sedatives should be used to combat as far as possible inflammatory phenomena.

Should the eye show a tendency to become generally involved, its early enucleation should be undertaken.

The first essential in treating these cases of penetrating wounds of the eyeball, should be the practice of thorough asepsis. The wounds of the cornea should be examined for bits of adherent iris, which should be either trimmed off or, if possible, replaced in the anterior chamber, lest a fistulous opening be established in the cornea.

Wounds of the sclera should be also thoroughly cleansed, care being taken to see that there be no prolapse of the ciliary body or other part of the uveal tract, so that the divided lips of the sclera may be closely approximate.

Scleral wounds should be closed by a suture through the most superficial portion, so that infection may not be carried down through the suture which is used to close the wound.

The safest medicines to use in the conjunctiva are boric acid—saturated solution—and argyrol solution.

In wounds of the central portion of the cornea, or any part away from the periphery, atropin may be used to dilate the pupil, and thus reduce its possible inclusion in the corneal wound. Quite the reverse, one should use a miotic, if the periphery is involved.

There will be found cases in which the wound is so extensive as to necessitate the immediate enucleation of the eyeball. Again, the wound may be small; but the tension of the eyeball has become so greatly diminished through the loss of the vitreous, that it would be inadvisable to allow the eye to remain.

There are cases on record where the penetrating body has pierced both the anterior and posterior walls of the eyeball, being finally lodged in the orbital tissues to the rear of the eye. One can well imagine the havoc

wrought as a result of this lesion, especially if the foreign body be infected.

As apparently trifling wounds of the eye may result in the destruction of the eye, it is hardly necessary to lay stress on the practice of thorough asepsis of the conjunctival sac and overlying structures; but also that the instruments used about the eye, as well as the hands, be thoroughly sterilized.

Cases: Master Brner—cut cornea from being hit in the eye with a piece of glass; Miss R—puncture with scissors; Miss Gopdie—puncture of eyeball with potato knife, Dr. Bird; Master Walker—puncture with bone button—scleral stitch.

SYMPOSIUM ON CANCER.

THE NECESSITY OF EARLY DIAGNOSIS IN CANCER.*

By GUY AUD, Louisville.

In no field of medicine is there greater need for a careful collection of statistics, for painstaking research, and for a proper correlation of facts than in that of cancer. While we have made notable progress in the prevention of cancer and in its cure in the early stages, we know practically nothing regarding its cause.

With our present knowledge of cancer we have reached a point where our chief hope in reducing the high mortality rate of the disease lies in acquainting the public with the seriousness of delay in securing competent medical attention, and in reenlisting the interest of the medical profession in the necessity of an early diagnosis and prompt treatment.

In order to give you a clearer idea of the appalling decimation of humanity by this disease I would like to quote a few of the latest mortality statistics on cancer. The figures given are for the year 1919 and are taken from the registration area, which then comprised about 83 per cent of the population and 61 per cent of the land area of this country. There were 68,551 deaths from cancer and other malignant tumors actually recorded in the registration area during 1919. According to careful estimates of the best statisticians 90,000 deaths from cancer occur each year in the continental United States. How does this compare with other causes of death? During the same period heart disease caused 111,579 deaths; tuberculosis, 106,958; pneumonia 105,213; and diseases of the kidney, 75,005.

Cancer stands fifth among the more common causes of death in the registration area and is apparently on the increase since the recorded death rate shows about 2.5 per cent more cases each year. Nearly every civilized country shows a similar increase. Better diagnosis and recording of cases does not fully account for this increasing death rate.

Is there a "cancer age?" Strictly speaking there is not. We know that infants and young people frequently die of the disease. However, about 95 per cent of all deaths from cancer occur at ages over 35. At ages over 40, one person in 10 died of cancer. Deaths from cancer cause 5.8 per cent. of the mortality rate for all ages. Largely because of neglect and ignorance 9 cases out of 10 are now fatal. If proper precaution and treatment were observed, it is probable that over half of the 90,000 yearly deaths which this disease causes in the United States could be prevented.

Of the 68,551 deaths from cancer during 1919 in the registration area 25,874, or 37.7 per cent, are due to cancer of the stomach and liver; 9,034, or 13.2 per cent. to cancer of the perineum, intestines and rectum; and 10,558, or 15.4 per cent. to cancer of the female generative organs. A further classification of some of the deaths by seat of disease might be of interest. While practically every part or organ of the body is subject to cancer in some form, the stomach is by far the most common seat of the disease, causing 16,506 deaths, or 24.1 per cent. Cancer of the uterus is second with 9,672, or 14.1 per cent. Cancer of the breast is third, with 6,262, or 9.1 per cent. Cancer of the gall-bladder and liver combined 8,364, or 12.2 per cent. Others of importance that might be mentioned are: cancer of the buccal cavity, 2,511, or 3.7 per cent; intestines 5,580, or 6.1 per cent; rectum and anus, 2,733, or 4. per cent; skin 2,467, or 3.6 per cent; bladder, 1,978, or 2.9 per cent; prostate, 1,221, or 1.8 per cent; and ovary and fallopian tube, 566, or .8 per cent.

The states which have the highest rates in 1919 are Maine with 116 deaths per 100,000 of population; Vermont, 113; and New Hampshire, 108. The lowest rates are shown for South Carolina, 33; Mississippi, 37; and North Carolina, 39. During the same period the death rate in Kentucky was 52.6 per 100,000 of population and in Louisville 109.6.

Of the total deaths from cancer, 39,975, or 58.3 per cent. are of females and 28,576, or 41.7 per cent. are of males. Year after year the statistics show that more than half of those who died of cancer are females, although the male population of the registration area exceeds the female.

The cancer rate has always been higher in

*Read before the Jefferson County Medical Society.

women, than in men, owing to frequency of involvement of the breast and uterus, but outside of those regions the liability is far greater in men. One-eighth of all female deaths above the age of 40 is due to cancer, while in men of the same age only one death in 14 is due to this cause. Cancer of the breast and ovaries is more frequent in the unmarried, while cancer of the uterus is more common in married women. Between the ages of 35 and 45 about three times as many women as men die of cancer. Fortunately, the forms of cancer peculiar to women are, many of them, curable by proper treatment when used in the early stages.

Notwithstanding this enormous annual toll of human life we are making progress in our efforts to eradicate cancer. Reports from the large surgical clinics show the percentage of cures to be increasing each year, which is gratifying in a condition that is otherwise hopeless.

While real progress has been made in the prevention and cure of cancer its cause remains largely a matter of speculation. Of the more popular theories as to its cause are: Virchow's theory of local irritation; Cohnheim's, of embryonic origin; Adami's of "habit growth;" and Hanseman's, of "anaplasia". Oschner₂ believes these theories aid in explaining the development of cancer but in each instance the seed in the form of some form of infection is missing.

Every part of the body is made up of cells and these vary according to the particular kind of tissue they compose. The various kinds of cells grow, perform their function and die, according to certain very definite laws of nature. This process is going on continually in every part of the body. Sometimes certain of these cells begin to grow and develop along lines which are not in harmony with their usual order. In other words they become "out-law cells" and refuse to follow the laws nature established. These lawless colonies may start up in any part of the body as the lip, breast or uterus and frequently form small nodules. All authorities agree that cancer is primarily a local disease; permanently curable in almost every case, by removal of the incipient growth. The disease nearly always gives warning signals while in this local curable stage and in a majority of instances is located in regions which are accessible to surgery.

We know that cancer often arises at the site of long continued local irritation. Some familiar examples are the smokers' cancer; cancer of the stomach following ulcer; cancer of the cervix from old scars or tears; cancer of the leg following chronic ulcer; and cancer of the tongue from the roughened edge

of a tooth. Many other examples might be given but the above instances cited will serve to prove the danger of cancer in tissues subjected to prolonged irritation. Many benign tumors, crypts, fissures, ulcerations and apparently simple skin lesions, not cancers at first, may change into malignant growths. The operation for the removal of these small growths is comparatively simple and leaves little or no disfigurement, while delay means a radical operation which is frequently mutilating and dangerous and offers the patient a much less chance of a permanent cure.

Once these seemingly simple growths have penetrated into the surrounding tissue, or cells from the growths have been thrown off into the blood vessels or lymphatics and carried to distant parts of the body, there to take root and grow, the condition immediately becomes hopeless, and the patient must pay the penalty for his procrastination. What a pity these incipient cancer growths are not painful. Think of the countless lives and the untold misery and suffering that might be spared if those having such growths could be driven to seek relief early.

The quacks and unscrupulous fakers prey upon the fears of these unfortunate people whom they secure into their clutches by cleverly worded advertisements of "cancer cures," which do not cure. These poor uninformed and credulous sufferers are doped with drugs internally, and pastes and lotions externally, and are relieved only of the contents of their pocketbooks. Finally after losing their best chance of cure, through delay, they come to the surgeon begging for relief from a condition which has become hopeless. Thousands of lives could be saved annually if we could teach the people that we know of no medicine that will cure cancer; that corrosive pastes are worse than useless and in most instances only eat off the top of the growth and stimulate the base to grow more rapidly. Tell them that their chance of cure lies in the early and complete removal of the disease. The quacks and charlatans could not thrive as they do if they did not fool the people into believing that every growth is a cancer.

The greatest step forward in the treatment of cancer came with the advent of X-ray and radium at a time when surgery seems to have about reached its limits in the radical treatment of the more advanced cases. We are particularly grateful for these valuable adjuncts because they have relieved us of a class of cases which are hopeless from a surgical standpoint and when operated upon often discredit surgery. The clearly operable cases are best treated by proper surgery, followed if need be by X-ray or radium. There is a definite place in the treatment of cancer for surgery and

for radiotherapy and I do not think one can be substituted for the other. I believe our best results are to come from a proper combination of surgery and radiotherapy, in selected cases. X-ray and radium are of value in the preoperative treatment of certain cases; in blocking the glands to prevent the spread of the disease; and finally, when operation has been delayed so long that the condition is hopeless a great deal can be done with these agents to prolong life and make the end more comfortable.

A large majority of fatalities in cancer have resulted from delay in treatment due to lack of recognition of the disease in its early stages. Owing to lack of knowledge of the essential facts concerning the disease part of the responsibility rests on the public for delay in securing proper medical attention, and on the medical profession for delay in diagnosis and procrastination in treatment. Our chief hope of reducing the number of deaths from cancer, lies in educational propaganda which should be directed at both the medical profession and the lay public. How many times have we seen patients with cancer in its early stages, when conditions were most favorable for a permanent cure, go to their physician for relief only to be nursed along by inefficient treatment until hopelessly incurable, and often without attempt being made to make a correct diagnosis. Often we are inclined to give too little consideration to the patient's complaint of vague internal disorders and thus allow a condition that might be easily relieved develop into an incurable one; when the diagnosis could have been readily made by X-ray or other examinations. The medical profession, as a whole, must be taught the absolute necessity of an early diagnosis in cancer. A careful history and physical examination should be made in every case. When possible, tissue should be removed for microscopical examination.

The campaign for instruction of the public should be an intensive and continuous one and in proportion to the seriousness of the cancer menace. It should be made interesting as well as instructive. The discussion of cancer should be frank and expressed in terms that will be understood, lest we arouse in many persons phobias as terrifying as the disease itself.

There are many things we should strive to impress upon the minds of the people regarding cancer; a few of which I would like to mention briefly in conclusion:

A large majority of fatalities in cancer have resulted from delay in securing competent medical attention. Cancer is primarily a surgical condition and in the beginning is a local disease, which by removal of the incipient

growth is permanently curable in almost every case. It is not a constitutional or "blood disease;" is not contagious; and so far as we know is not hereditary. The onset of cancer is usually painless and for this reason is especially insidious and dangerous. There is no medicine that will cure cancer. Pastes and lotions are worse than useless, because they frequently stimulate the cancer to grow more rapidly and give the victim a false sense of security while robbing him of his chance for cure. Lumps in the breast, ulcers and fissures which do not heal, birthmarks, scars, warts and moles may become cancers if not treated and cured. Persistent abnormal discharge or bleeding, especially in women past 40, is very suspicious of cancer. People should be taught the importance of going to a competent physician regularly, for a thorough and painstaking physical examination; not because they are ill, but in order to be able to remain well. They should demand a proper examination and accept nothing less.

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CANCER FROM THE STANDPOINT OF THE INTERNIST.*

By W. F. BOGGESS, Louisville.

Cancer from the viewpoint of the internist,—a subject so fraught with importance, and so large in material, that in the few moments allowed in this symposium I can only emphasize the fact that after all the onus, the burden, and the responsibility of this great cancer problem lies largely upon, and with the internist.

In the nearly forty (40) years of my medical life, with the millions in money spent and the persistent research of the most profound scientists in our profession, we know very little more about the etiology and morphology of cancer today than we did at the beginning. These important facts, however, are proven and emphasized, viz: that cancer is becoming much more frequent and that practically, without exception, cancer is at first only a local disease, and that if recognized or recognizable at this time, is always curable.

It is to the internist that humanity looks for protection and advice and wide-awake watchfulness against the approach of or protection from disease. The whole acme and quintessence of modern medical science is in

*Read before the Jefferson County Medical Society.

the prophylaxis—the prevention of disease. It is to the internist that the profession looks for that education of the public as to this cancer problem so that the public can give immediate and intelligent attention to known danger signals and warning signs, and thus co-operate with their physician in attempting to reach a decision while the disease is still local, or while, in what is sometimes styled, the pre-cancerous stage.

While the responsibility, it is true, now rests upon the public for delay in securing competent medical advice and attention through ignorance and superstition, and fear, yet that doesn't lessen or lighten the responsibility of the physician for his delay in diagnosis and procrastination in treatment—nor does that lessen his responsibility, one iota, in his duty towards the public in this matter of education not alone of the cancer problem, but every other problem that pertains to health, happiness and physical efficiency.

In this propaganda of cancer that is now being given in America there is a warning in a recent *A. M. A. Journal* that is apropos. I quote a few sentences:

“An inevitable accompaniment of directing special attention to any disease is to arouse in a certain number of persons phobias almost as terrifying as the disease feared. To warn the public that “moles, excrescences, fistulas and warts” are the first signs of cancer is to erect a specter capable of shattering even a normal mentality. To say that symptoms of indigestion are ‘signes of cancer’ is so small a part of the whole truth that it is better left unsaid. Give the public all the facts—but facts only.”

I saw some years ago some of the direful results of senseless and unscientific propaganda on that very important subject of the venereal problem—some of it did much harm and no good. When we are attempting to educate the public in the matter of health whether it be cancer, tuberculosis, venereal diseases or any of the other preventable diseases, we must take the public into our confidence and ask their intelligent co-operation, appealing to their reason and intellect, and not their sense of fear, and thus “giving the public all the facts, but “facts” only.

I shall not attempt in this paper to go into the statistics of the cancer problem other than to say in the two and a half years of war, the U. S. lost only about 80,000 or 90,000 soldiers, killed or died from disease—that in that same period America lost from cancer over 180,000 people, and while these soldiers made the supreme sacrifice largely of their own volition for the sake of humanity and didn't die in vain, yet I think we can say that a very great per cent of the deaths from cancer represents a

needless waste of life, for a great per cent of all of these deaths begin primarily as a local condition, and this local condition in such a location that it could have been recognized and removed or cured if we had had intelligent co-operation from the patient, and if the physicians themselves had been on the job, as they should have been.

It is estimated that 5 per cent of all of the deaths after the age of 30 die from cancer, and conservatively at least 90 per cent of all cancer cases die from this disease.

A discussion of cancer must include the malignant neoplasms as follows: “Malignant neoplasms may be divided into those of mesoblastic origin and those of epiblastic origin.

1. The mesoblastic tumors are those which consist of an unrestrained reproduction of a mesoblastic type of cell. They may be further divided into:

a. Sarcoma: an unrestrained reproduction of a connective-tissue type of cell.

b. Lymphosarcoma: an unrestrained reproduction of a lymphoid type of cell.

c. Endothelioma: an unrestrained reproduction of an endothelial type of cell.

d. Glioma: an unrestrained reproduction of glia type of cell.

e. Melanoma: an unrestrained reproduction of the chromatophore cells.

2. Malignant tumors of epiblastic origin may be subdivided as follows:

a. Malignant adenoma, a tumor preserving adenomatous characters, but being to a greater or less degree an unrestrained proliferation of a glandular type of cell.

b. Carcinoma, an unrestrained reproduction of a glandular type of cell.

c. Epithelioma, an unrestrained reproduction of an epithelial type of cell.

The chief interest of the internist centers around sarcoma, epithelioma and carcinoma. Just one word as to age. While we say that cancer is essentially a disease of adult life, and possibly 85 per cent or 90 per cent occur after 35 years or 40 years, yet it does occur at any age—all types occurring occasionally in children as young as 8 to 15 years, particularly do we find the sarcomata in early life. I have seen two brothers with carcinoma of the stomach, 26 and 28 years of age—both operated on, both died. I have seen many cases of sarcoma in children.

Now next the question of heredity in cancer. This is quite a mooted question. As you all know our lists of hereditary diseases and direct transmissions have greatly narrowed until we can name very few diseases where heredity is a direct and causative factor. We know that certain families of trees and plants are subject to certain destructive diseases

very similar to cancer in the human. We know in horticulture that certain breeds of the same plants and trees are more subject to destructive disease, certain cell qualities and cell resistance are transmitted in the human race just as in the plant. The oak and the hickory generates its strong cell to its progeny. The cottonwood and the softer trees their cells to their progeny. So we inherit the same vigor and vitality or lack of vigor and vitality of cells from our progenitors.

We see enough cancer in members of the same family to make us more suspicious of any neoplasms and more watchful of any abnormal condition, ulceration, or trauma of certain organs than in other families. It can be inferred with some probability that it is a local or circumscribed tissue predisposition, and that this predisposition is not a general one effecting the entire body equally but that the tendency transmitted effects mainly one organ system.

It would be interesting, if time allowed, to present the latest collective statistics illustrating the relative frequency of cancer in the various organs of the body, in percentages for every one thousand deaths from Cancer. Also the frequency with which some of the most important organs are attacked in the two sexes. Cancer is far more frequent in women than in men. This fact is to be attributed to the large number of cancers which occur among women in the uterus, and in the breasts. The large number of cancer of the stomach help to swell the male proportion, but by no means in a manner peculiar to men.

What, and where then are the cancers located that are capable of being early recognized by the internist, and thereby cured? Certainly not those of the viscera,—either thoracic or abdominal, but we must remember that many of these cancers are mastastases of and secondary to recognizable, and primarily curable varieties, and in this regard are preventable if the primary external focus had been discovered and eradicated.

It might be interesting, and important, here to call attention to the differences of the spreading of the metastases between sarcoma on the one hand, and carcinoma and epithelioma on the other. Carcinomatous metastases usually, if not always, occur by the blood stream. In carcinoma and epithelioma the cells are at first, almost always swept away in the lymph channels. Why it is that the metastases of these two forms of malignant new growths invade the body by means of different paths is not thoroughly understood.

The great and outstanding responsibility of the internist in the cancer problem lies in his acumen and earnest endeavor to recognize the danger signs and definite warnings of any

ulceration, neoplasms or trauma, (from chronic irritation to a single contusion) in certain organs and tissues, particularly at certain ages:

The uterus and the genital organs of the female, the breasts, the tongue, mouth and throat, the testicle, the penis, the skin, the head, face, neck and extremities, and bones are all seats of malignant neoplasms, and are all within the possibility of early recognition and in a large per cent of cases removable in the local stage, and thereby curable.

In the internal cancers of course we have no means of diagnosing them until they are so far advanced that they are far beyond any possibility of eradication for permanent cure. Our only hope in those cases is to prolong life and relieve pain and suffering.

All nodules in the breast should be looked upon with suspicion, and I care not at what age, should be removed and examined, for 80 per cent of all tumors of the breast are either cancerous or potential, and the other 20 per cent suspicious, therefore in a condition so fraught with danger why should we ever hesitate, especially in women past 35 years of age, to suggest that the neoplasm be removed and examined, and always insist on radical work being done.

In all chronic ulcerated conditions in and around the uterus after forty years of age we have sufficient knowledge to appreciate that chronic ulceration and inflammation in the uterus at this period of life is one of the principle factors in the development of cancer. Chronic erosions, cervical endometritis, deeply seated gaping cervical tears, cystic degeneration, myomatous proliferation, fibro-myomatous degeneration, excessive and prolonged menorrhagia, without definite etiology, and many other like conditions come within the scope of suspicious pre-cancerous conditions. The great majority of cervical tears, however, are not even cosmetically, hurtful or harmful. It is therefore the duty of the internist to tell and impress upon all women after 40 years of age the necessity of watching the breasts for any new growths or abnormal "lumps" and at once consulting their physician. And also to go to their physician annually or semi-annually and submit to an examination of the pelvic organs, thus increasing the safety of the patient against cancer development.

Cancer of the lips, mouth, tongue, throat, head, face, and neck show about 110 out of every one thousand deaths from cancer, and a very much larger percent in total cases and is therefore a very large and important series for early recognition and diagnosis by the internist. Those who have never heard Bloodgood lecture on cancer of the tongue and mouth, should read his splendid paper in the

A. M. A. *Journal* of October 29th. What he says of the tongue holds good for the whole oral cavity. He claims, and I take it, that everyone accepts his views, that leucoplakia, bad teeth, areas of irritation and ulceration, syphilitic gummas, warts, fibromas, smokers' burns, are all precancerous lesions and thereby makes cancer of the tongue and mouth and throat largely a preventable disease.

Cancer of the skin and bones, and external organs are generally easily recognized in their early stages, and the patient should always be informed as to the suspicions of the physician, and enlightened as to the dangers and probabilities of delay.

In cancer of the skin, a very common occurrence after 60, we might say, in the very earliest stages of epithelioma of the skin there may be nothing more than a rose-colored dot of congestion, or a little excrescence, or roughening or scaling at one circumscribed spot. Hyperkeratosis seems to be a constant feature of the early stages of the squamous-cell variety, so that in these cases the earliest symptom is a persistent scale, which later appears as a scab, now and then dropping off and generally leaving a bleeding surface. The basilar-cell epithelioma, on the other hand, usually begins as a minute, solid nodule, and this gradually enlarges so that there is a definite stage of solid tumefaction before ulceration occurs.

Also chronic inflammations of the stomach (particularly chronic ulcers) gall bladder and rectum and other abdominal organs in patients after 50 years of age should be looked upon with potential suspicion.

In conclusion, as an internist to my fellow internists let me again impress upon you that this great cancer problem rests upon us, for to us the public and the profession must look for the constant education of the people, and the early recognition and diagnosis of all potential possibilities, and thereby by our acumen saving many human lives and alleviating much human suffering and sorrow.

In this matter, be true—and frank—and honest to your patient as well as to yourself, and remember that the most important thing is the early diagnosis, and that your treatment and my treatment are absolutely without avail as far as the administration of internal or external medicinal remedies are concerned.

The whole subject of treatment rests upon the triumvirate, radium, x-ray, surgery,—to these three in the early stages we can send our patients with hope and assurance.

THE CANCER FROM THE SURGEON'S STANDPOINT.*

By C. G. FORSEE, Louisville.

It is the belief of the best students of this subject that cancer as a growth or tumor is but the beginning of the termination of perhaps years of pathologic physiology (if this term may be employed). It is the unfortunate lot of those living at present that no means of determining what this pathology is, leaves us to know only what occurs after the beginning of the terminal process. In dealing with this condition as we find it we think surgery offers the best chance of relief of any known method. It is the belief of the writer that no place in the realm of surgery is the necessity of good judgement so important as is required in dealing with cancer. For example many conditions which were formerly thought to have reached the inoperable stage may be operated on with fair hope of relief of their disease and perhaps may enjoy many years of useful, comfortable life. It is true that the operative mortality is doubtless higher but the number of cases ultimately relieved is greater than if these cases were consigned to that class known as "inoperable." It is, we think, undoubtedly true that radical surgery is what should be practiced but this does not mean mutilating surgery. We think that in our attempts to do radical surgery we have made this mistake and in cases of amputation of the breast for instance, have left the patient in an ultimate bad condition as to pain, edema of the arm, etc., which could have been avoided had X-rays for "blocking" been judiciously used before and after operation.

Unfortunately it is usually the mechanical interference of some physiologic process and not pain which brings our patients to us for relief. This usually means that the condition is well advanced and that involvement away from the original site has often taken place.

All surgeons have seen patients with mechanical obstruction of the bowels from an advanced cancer of the colon. The obstruction and not the presence of a tumor brought the patient to operation. So it is frequently the case that the beginning of the disease as the patient sees it is when a mechanical disturbance of some function of an organ or tissue takes place.

As study of cancer from the time of formation of the tumor until it ends in the death of the patient is difficult because the time of beginning is very indefinite so far as the patient

*Read before the Jefferson County Medical Society.

knows and the duration of life after cancer begins varies much because cancer of itself rarely kills, but the end comes from mechanical obstruction, such as stenosis, compression, perforation or hemorrhage.

As to diagnosis. Of the many tests for the diagnosis of cancer either early or late none seem to offer even as accurate reaction or reading as the Wassermann test does for syphilis. Chemical laboratories offer little of value in diagnosis. Diagnosis by radiologists is limited to but a few locations but is valuable in the care of one afflicted with cancer. We always try to impress the patient with the belief that operation is only part of the treatment for relief of the condition and that the care of an internist and an expert in the use of x-rays and radium are as essential to the proper care of them as anything a surgeon can do. We think the attempts of a surgeon to relieve his patient by an operation with the statement that they have nothing left to do but trust to luck is but little short of criminal. With the aid of an internist, an x-ray man and all our best efforts, our results have been very disappointing.

Tissue cells in the human body for some unknown reason vary so from normal that this variation becomes a malignancy.

That cancer is not parasitic or even bacterial seems pretty well proven. Until we know what causes cells to take on malignancy we will perhaps never be able to formulate a definite plan of medical treatment. Faulty nitrogenous metabolism seems to have something to do with the cause of it.

It seems that as the advance of biological and chemical study advances, especially as more is known about colloids, the nearer we are to the solution of this problem. So far surgery offers the best results along certain lines, but, surgery has its limits and just when the knife must be resorted to, as before stated, requires rare judgment.

We say, and very properly, the earlier the better, and plead for early removal of suspicious tumors, but as every woman who has borne children and some who have not, has lesions liable to become cancerous (for it is in the uterus we see most cancers in women) we cannot argue that every uterus should come out. The same applies to the male where the stomach seems to be the most likely site. We cannot advise operation on every man who presents himself to us with some complaint referable to his stomach. Unquestionably far more harm is done by waiting too long before resorting to operation than from operating too early. The judgment of the physician should ever be unbiased and claims put forth by various advocates of this and that treatment should not be allowed to warp that judgment.

X-RAY AND RADIUM TREATMENT OF CANCER.*

By WM. J. YOUNG, Louisville.

In the treatment of malignancy, radium and x-ray therapy have, in the past few years, assumed prominent place. These two agents have been accepted by the surgeons as valuable adjuncts to operative procedures, both before and after operative intervention. It has also become an established fact that there are conditions in which they have been found more dependable than the knife, namely, in rodent ulcers, carcinoma of the cervix and those malignancies inaccessible to surgery. As is true in surgery, the earlier the treatment is instituted the better the prognosis; so it is with radium and x-ray therapy, the younger the cancer cell the easier its eradication. Also, as in surgery, the metastasizing points should be treated before treatment is directed to the primary involvement.

The different rays of radium and x-ray are called alpha, beta and gamma. The alpha rays are of the least penetrability and are seldom used, except for very superficial lesions. The beta rays are used where the lesions are of slight depth. The gamma rays are depended upon where deeper lesions are to be influenced. Filtering the alpha and beta rays in x-ray is done by aluminum, zinc or copper; in radium with a silver, platinum, gold or brass.

The factors of importance in radium and x-ray therapy are: In the application of radium:

First, the amount of radium; Second, the degree of filtration; Third, the time of exposure; Fourth, the distance from lesion.

In the application of x-ray:

First the spark gap; Second, the number of milliamperes used; Third, the time of exposure; Fourth, the amount of filtration; Fifth, the distance of tube from lesion.

The amount of rays deposited must at all times be governed by the resistance of the structures covering or surrounding the lesion being treated. The cancer cells are easier resolved than normal tissues, and the object of treatment is to influence these cells without producing permanent changes in the surrounding structures. The judgment with which these factors are used contribute to the end-results of treatment, as well as the judgment in directing these agents with regard to cross-firing and blocking points of metastasis.

Radium and x-ray therapy may be used sin-

*Read in a Symposium on Cancer before the Jefferson County Medical Society, November 7, 1921.

gly or collectively. Where the malignancy is equally accessible either agent may be used by a radiotherapist having an assured technic. Radium is more "fool proof" than x-ray, as its factors are constant, while those of x-ray are in the main contingent upon an electric current which may vary. When the malignancy involves a large area, time can be saved by application of x-ray and the danger of overlapping areas treated reduced to a minimum. Where the lesion is inaccessible to x-ray, the agent may be used conjointly to points of possible metastasis.

The logical situations for radium therapy are those inaccessible to x-ray, viz.: first, the nose and antrum; second, the mouth, tongue, roof, floor, etc., larynx, pharynx, esophagus and bronchi; third, the urinary bladder and prostate; fourth, the vagina, cervix and uterus; fifth, the rectum; sixth, in the isolated glands or special points where we feel we may produce a more uniform radiation. In most of these locations radium treatment may be further enhanced by cross-firing with x-ray through the skin from the outside. Brilliant results, as well as many failures, follow the employment of these two agents. Statistics are misleading and at the present time of small importance. It has been proven both remedies have a curative action on malignancy, but as in surgery the lesions must be recognized and treated in their incipiency if permanent good is to ensue. The important point to be mentioned at this time is cooperation with the medical profession, and especially the surgeons who should most of all appreciate these two adjuncts to their work.

At present four-fifths of the radiotherapist's work is prolonging life, overcoming the foul smelling discharge and relieving pain of those afflicted with cancer. It is the hope that we may have the opportunity to cope with the disease in earlier stages that keeps us interested.

Recently in carcinoma of the cervix radium has been universally conceded to be the agent of choice. Statistics in the next ten years may prove more gratifying, but, as yet, our statistics on malignancy are very sad and owing mainly to the fact cancer is seen by us usually after it has become hopeless. The prevention of cancer depends upon:

First—The cause of invasion (at present unknown.)

Second—The recognition and prompt eradication of pre-cancerous lesions beginning to show signs of activity and prodromal symptoms of cancer.

Third—The early diagnosis.

Fourth—The immediate institution of proper treatment.

With the yearly increase in the death rate

from cancer the public is becoming interested and alarmed. From a radiological standpoint if the percentage of deaths is to be decreased, the radiotherapist must be given a more selected class of cases and thereby have a chance of success.

Radium and x-ray therapy has been the "dumping ground" of surgeons in the past years. Notwithstanding that fact, these remedial agents have withstood the onslaught of moribund cases and have become valued instruments in the attempt to eradicate cancer. Radiotherapy is still a child in medicine, but better technics are being evolved, and we are looking to the future for greater hope of success in the treatment of malignancy.

Larger x-ray machines are being manufactured, x-ray tubes are being invented to deliver greater penetration, physicians are becoming trained in x-ray therapy and the day has come when radiotherapy is no longer considered a side issue to those who do radiography. Radiography and x-ray therapy are two distinct entities and those who hope to become proficient in either had best lend their support to the one which interests them most.

If the larger x-ray machines are feasible and prove an advancement in x-ray therapy, this will have a tendency toward separating diagnostic x-ray work from the therapeutic application of the rays, as it will hardly be possible to take pictures with powerful machines contemplated for therapeutics. If the advent of the large machine does nothing, more than to separate the radiographer and the radiotherapist it will represent a distinct advance. It is to be hoped in the near future endowments will be raised and means taken so that research work can be instituted to advance and further radiotherapy. With the exception of the work being done in a few institutions, little effort is being directed toward the scientific study of cancer, and that work is largely of a surgical nature. Of the large sums of money expended on preventative medicine, that spent on the cancer problem forms a small part. It has proven an illusive thing to date and surgery seems to have reached its pinnacle. I would suggest that greater consideration be accorded these two remedial agents and that they be given an opportunity to function under more auspicious conditions, hoping they may thereby perform greater service in their attempt toward success.

The public at present leans toward radium treatment with great confidence. Those of us who are working in this field know that unless patients are seen early and promptly treated our chance of cure is meagre, and isolated cases of a seeming cure form the

basis of our treatment in advance lesions. The success of x-ray and radium treatment resolves itself in the same old problem confronting other remedies: early recognition and prompt treatment. When the medical profession more carefully studies and investigates precancerous lesions and symptoms, and then only, may we hope to see the incidence of cancer lowered. I feel very hopeful especially in skin cancers. I am referred for treatment more patients with precancerous lesions each month, and of course therein lies our best chance of preventing the development of cancer.

DISCUSSION:

Frank T. Fort: This subject interests me very much, as I think it should all surgeons and medical men, from the fact that statistics show cancer is on the increase, and it seems to be increasing more rapidly in highly civilized countries where the population is dense than in outlying or remote districts. Cancer is seldom observed in Africa, Egypt and certain northern localities such as Lapland, Iceland, etc. There is less cancer in India and China than in this country. Switzerland has a death rate from cancer of 12.9 persons per 10,000 people; England about 11.5; the United States and Germany practically the same, viz, 8.

It is perhaps well to think of our own country first. Statistics show that 90,000 people died from cancer in the United States during 1920; this is most appalling. Mayo claims that of all patients with gastric cancer coming to his clinic, 70 per cent can be traced to ulcer microscopically. We know how difficult it is to get patients with gastric disturbances to consult the surgeon early. They go from one doctor to another complaining of indigestion or some other trouble which perhaps is the beginning of cancer.

External cancers should be eliminated as soon as discovered and the diagnosis can usually be made early. Cancer of the breast is also important and every nodule should be immediately removed. And I am uncompromising in my attitude, based upon what information I possess concerning the x-ray and radium, that the knife is the thing to use in the treatment of cancer. If thoroughly removed with the knife, the danger is obviated of using too much or too little x-ray or radium which might produce irritation and increase the rapidity of the cancerous growth. In my opinion radium and the x-ray have their greatest field of usefulness in the treatment of inoperable cancer, but I am unwilling to concede these agents a place in precancerous lesions or even in developed cancer which can be surgically removed.

The following statistical tables seem of especial interest in this connection:

DURATION OF CANCER:			
	First Subjective Symptoms to Diagnosis. MONTHS.	From Time of Diagnosis to Death. MONTHS.	Total Develop't. Time. MONTHS
G ^l bladder cancer	4.2	4.0	4.6
Liver cancer	4.7	2.7	7.4
Esophagus	6.0	4.0	9.3
Uterine	6.2	4.4	10.6
Stomach	7.0	1.8	8.8
Throat	7.5	1.5	10.0
Intestines	8.6	5.5	13.1
Breast	9.1	...	19.2
Various skin	8.0		
Larynx	8.9		
Legs	25.0		
Face and head	45.6		

Carl Otto: Second International Congress on Cancer, 1910, 429

In 1920, 90,000 persons in the United States died of cancer and these comprised 52,884 women and 37,116 men. Colored people were less affected than whites.

Organs Affected	Male	Female	Total
Stomach and liver	17317	16976	34293
Reproductive		13671	13671
Peritoneum, etc	5141	6839	11980
Breast	132	8237	8369
Mouth	2775	564	3339
Skin	2045	1114	3159
Miscellaneous	9706	5483	15189

Of this number 85,883 were white persons; the balance colored.

If all these 90,000 patients with cancer had applied early to the surgeon for treatment, I believe from 30,000 to 40,000 lives could have been saved. With the exception of cancer involving the stomach, liver and intestine, there should be little difficulty in making the diagnosis if careful examination is made.

In closing my discussion I wish to present the following unique decalogue written by Dr. Franklin H. Martin, of Chicago, Secretary-General of the American College of Surgeons. Dr. Martin says he got the idea during the Detroit meeting of the American College, when Dr. Allen B. Kanaval visualized ten cancer "points" by throwing them on the screen. These Dr. Martin has translated into the "Ten Commandments of Cancer."

- (1) Remember that cancer is a relentless foe of humanity; that it attacketh the rich and the poor; the learned and the ignorant, and that its toll of death is greater than the destruction of the most malevolent war.
- (2) Remember that cancer in its beginning can be cured, and that the wise man, accepting the advice of science, and recognizing the beginning, causes the cancer to be cut from the body.
- (3) In this affliction heed not the voice of the ignorant, and submit not thy trouble into the hands of the Quack, because thereby death will be foreordained.
- (4) Search thy body for blemishes, the first signs of cancer, and if thou shouldst find these signs hasten to the physician that they may be interpreted and, with the disease, eradicated.
- (5) One day each year thou shouldst rest

from thy labors and give the day unto an examination of the body, that the physician may search into thy body for ills that should the signs of cancer be evident, thou may be spared the most dreaded of deaths.

(6) Thou should remember that cancer is not a blood disease but rather an ailment which begins in one spot and spreads slowly, extending through the lymphatics; nor is it hereditary.

(7) Remember that cancer can be cured if completely removed by the knife before it extends through the lymphatics or blood stream, and that no other means of curing deep-seated cancers has been discovered, but be it known that radium and x-ray hold out hope because of their effect on superficial cancers, and delay the progress of inoperable cases.

(8) Remember that cancer is not painful in its early stages.

(9) Remember that irritation of a tissue favors cancer; that a sore tongue irritated by a rough tooth, a cracked lip, a cigar a pipe, or a cigarette, and warts upon the eyelids, nose, or face should command the attention of a scientific physician.

(10) Remember without ceasing that thou shouldst insist upon the prompt removal of cancer after a sure diagnosis has been made, allowing of no delay, for death from cancer is death in its most horrible form—slow and agonizing to the patient and a spectacle which breaks the hearts of those near unto him.

(If in doubt, give cancer the benefit and remove the growth.)

J. Garland Sherrill: There seems to be some timidity on part of the members in discussing the cancer problem. I presume it is for the same reason that we refrain from talking about many other medical and surgical subjects, viz., that we know very little about cancer. I have noticed one important feature in every discussion of this kind, i. e., "get cancer patients early and treat them thoroughly."

I do not believe the medical profession is so much at fault for delay in diagnosis of cancer as we have been led to believe. Most physicians recognize a cancer when they see it. The greatest trouble is that the patient does not consult the physician until the disease is well advanced. Unfortunately, the early development of cancer in many instances presents but few symptoms, and after symptoms arise the disease is usually far advanced.

The only thing which really offers the cancer patient very much is the advice which has been emphasized by both Dr. Aud and Dr. Forsee, that patients should submit themselves at least once each year to a competent physician for a thorough and complete physical examination. There is no reason in the world why this should not be done, and it is easier to keep well than it is to get well after you are sick. If the pub-

lic could be made to realize that this is necessary, especially as people are growing older, no doubt many cases of cancer would be detected in the early stages or even before the disease has developed.

In regard to the term precancerous: No one can possibly determine whether a given lesion is actually precancerous or not. No one can tell in advance whether a benign lesion will or will not eventually become malignant. Whenever I hear the word precancerous I am reminded of a favorite expression of the late Dr. J. A. Ouchterlony in his lectures: "Either the patient has the disease or he has not," that is the question we must determine. No one can tell whether a wart or mole on the face is going to become a cancer or not. If the wart or mole is radically removed early it is unlikely to recur as cancer, but it may do so. If a mole or wart is irritated it is likely to develop into malignant disease. Whether or not we should remove every mole or wart is a serious question in my mind. Of course every mole or wart which is growing should be radically removed. Whether such lesions should be treated with the x-ray, radium, or both, certainly the physician should be able to determine. It must be remembered that the x-ray sometimes causes cancer. Small doses frequently repeated will produce malignant disease, whereas massive doses will destroy it. A man who is expert in the use of the x-ray may accomplish a great amount of good, but one who is not expert may do much harm. The same statement is true of radium. Personally, I do not feel like recommending either the x-ray or radium over the knife as a cure for cancer. We can say that radical removal of the growth may prolong the lives of patients for a long period of years and it may cure them. The same thing may be accomplished in certain instances by the x-ray or radium. Superficial malignant lesions have undoubtedly been relieved by the use of both these agents; they have also been relieved by other means with which all of us are familiar.

Personally I am frank to confess that I believe malignant disease is due to invasion of the system by some outside micro-organism. I think we must admit this when we know that tuberculosis and certain other diseases are produced by the invasion of outside organisms. The mode of action, however, is somewhat different as the cancer organism is slower and more persistent in its development. I have shown a man before this society who had an epithelioma of the lip twelve years ago; he was operated upon and cured. He now, twelve years later, has a carcinoma involving the opposite side of his face and lower part of the ear. I do not believe there is any relationship whatever between the two neoplasms, but the same condition of the body and a local cause which stimulated the first tumor

is also responsible for the second formation. Had there been any connection between them the second growth would certainly have developed earlier, it would have appeared along direct lymphatic channels instead of on the opposite side. The point I wish to make is that the seed or organism whatever it may be must exist within the body before cancer can develop.

Ochsner and Nazam, of Chicago, have announced the discovery of the organisms of cancer, but I have seen no adequate proof of their claims. I am confident, however, that in the not far distant future the organism or virus which causes cancer will be discovered. It is interesting to note, in this connection, that the "cancer germ" has been discovered and prematurely announced on several previous occasions.

If we may judge by the increased incidence and high mortality from cancer, it would appear that we are handling the disease in a very imperfect and unsatisfactory manner. If treatment were effective we would naturally expect a marked reduction in the number of deaths from malignant disease, but the converse is true, the number of cases of cancer are increasing each year and the death-rate when compared with other diseases is exceedingly high.

Cancer is pre-eminently a disease which attacks people in civilized communities; among the partly civilized the disease is said to be rare and among the uncivilized it is almost unknown. We must remember that civilization is one of the greatest factors in the distribution of germ life. Plants are the subject of cancer the same as human beings, and plant cancer is always due to an external parasite. Therefore, reasoning from analogy it seems certain that cancer in the human family is also due to an external organism or virus. The treatment of plant cancer is complete removal of the offending growth, and in man should be similarly treated when possible. When we learn how to tell that a given benign lesion is going to become malignant, then we will be wonderful doctors.

J. Hunter Peak: Because of the fact that we know little about the cause of cancer our modes of treatment are more or less unsatisfactory. I am in accord with the opinion expressed by Dr. Sherrill that cancer is probably the result of micro-organismic growth, possibly so small that the microscope has not yet discovered it. There may be cells that are ameboid in character which have something to do with the production of cancer. More than twenty years ago Gaylord, of Buffalo, New York, claimed he had discovered ameboid cells which he isolated from cancer in the human being, grew them on Irish potato and inoculated animals subject to cancer, such as mice and rats, and from a microscopic standpoint reproduced identically the same growth that he had taken from the human being. Other men making investigations along this line are now

claiming that the organism of cancer is so small that the microscope cannot find it. We all know that smallpox is due to the invasion of some micro-organism, yet we do not know what it is because we have not seen it. We also know that the disease can be produced by inoculation with the virus which has been filtered and everything removed but the organism which gives rise to the disease. Along the same line a filterable virus from cancer has been inoculated into rats and mice, chickens and other animals subject to cancer, and identically the same growth produced that is found in the human being.

On the other hand, we have evidence from other sources that cancer may be the result of dietary regime due to civilization. Some have claimed that cancer is the result of eating too much salt—the chlorine producing undue irritation of certain tissues of the body and thus favoring the development of malignant disease. It is claimed that the aged are more susceptible to cancer than the young because their tissues become super-saturated with chlorine on account of inactivity and consequent reduction in elimination. In such cases irritation from broken teeth, pipes, cigars, etc., contributes to the production of cancer of the buccal cavity. Prolonged irritation and the presence of chlorine are regarded by many observers as prolific causes of cancer in various tissues of the body. It is a matter of common observation that cancer is more frequent in persons over forty years of age than in the young, and one explanation for this disproportion is the long-continued use of irritating foods. The fact has also been mentioned that the aborigines used no salt and they were rarely the subjects of cancer. Yet we know that animals and fish which live in the water are subject to cancer, and if salt had anything to do with it certainly fish and animals living in the ocean where the water is intensely salty would be more subject to the disease than animals living on land or in fresh water. However, this has not been shown to be true.

I am confident, as stated by Dr. Sherrill, that the time is coming when we will know more about cancer than we do now, when we will understand the cause, and we will then better understand the treatment. At present there are three methods to be considered, i. e., removal by either x-ray, radium or the knife. Early diagnosis and prompt treatment are the keynotes to success in the management of malignant disease.

Carl Weidner, Sr.: The subject is of equal interest to the internist and the surgeon. The reason internists see more patients with cancer than those engaged in other branches of medical practice is because they are called upon to examine and treat a greater number of people suffering from various disorders. As there is no medical cure for cancer, when a patient comes to us with cancer it becomes our duty to refer

him to the surgeon, the x-ray man or to the radiotherapist. The successful treatment of any disease essentially depends upon its etiology and upon early diagnosis. We do not know the cause of cancer. The irritation theory was emphasized by Virchow more than fifty years ago. Many forms of bacteria, protozoa and various other low types of micro-organismic life have been studied in connection with the production of cancer, but no definite conclusions have been reached concerning the true etiology. The labors of such men as Russell, Metchnikoff, Plummer, Ruffer, Gaylord, Park, etc., have not settled the question.

I wish Dr. Peak would give us his authority for one statement he made. So far as I am aware there is no authentic case on record of the transmission of cancer from animal to man or vice versa. Transmission has occurred in the same species but not from one species to another, so far as I am informed.

What shall we do when a man comes to us with a small mole, wart or plaque of hyperkeratosis on the face or elsewhere? Shall the lesion be immediately removed? How can we make the prediction that a benign lesion of this character will eventually become malignant? We cannot make a positive diagnosis of cancer by merely looking at the lesion. The only positive diagnosis is made by a careful histologic examination. Otherwise we must rely upon our clinical experience. Who does not know the difficulty of deciding, for instance, whether a lesion in the mouth is due to cancer, tuberculosis or syphilis?

Cancer is more common after the age of thirty-five to forty-five years. We are aware that elderly people have a lessened vitality of the connective tissues, and cancer is essentially an epithelial growth. It represents a fight between connective tissue and epithelial tissue, in which the epithelial tissue wins the fight. Any irritation has a tendency to produce hyperkeratosis, the mucosa of the tongue and other parts of the buccal cavity may show this effect of irritation; in fact any tissue continually irritated, such as the mouth, stomach, uterus, breasts, etc., are prone to develop malignancy. An illustration of this is the so-called "smoker's cancer;" what are we to do but to tell the patient he must not smoke?

In considering the question of nutrition in the production of cancer, it has been proposed that the eating of meats may have some influence. This feature is being studied but we have yet no special data of value. The ingestion of salt and excess of chlorine has been mentioned. A certain amount of chlorine is excreted but when there is considerable excess in the tissue, irritation may be produced. This feature is worthy of further study because we know cancer is most prevalent among the highly civilized and in

countries where people live well and eat much meat. The question of chlorine and meat eating may have more influence in the production of cancer than is at present believed, because we know that in certain sections where vegetarianism is the rule the incidence of cancer is very low. Whether the predominating causative factor in cancer is tissue irritation, a lowered resistance of the connective tissues or micro-organismic invasion we do not know. I am inclined to the latter theory.

Now as to radium and x-ray: we know that they are extensively and successfully used in many pathologic conditions of the skin, either because they show the clinical picture of malignancy or because of the fear that the lesion may later become malignant; but how do they know this? There is no way to determine whether a lesion is malignant except by microscopic examination; just as in some obscure pulmonary disease we cannot positively differentiate tuberculosis from syphilis or cancer except by the finding of the tubercle bacillus. Statistics as to cures may thus be made quite uncertain.

Finally, I would like to have Dr. Keith, before closing the discussion, tell us what are the statistics as to authentic cures of carcinoma by the x-ray treatment.

D. Y. Keith: In all propaganda directed toward the prevention and treatment of cancer we must consider that the medical profession needs to be educated as well as the laity. In this discussion little has thus far been said about pre-operative radiation, which is just as important as radiation in what are believed to be inoperable cases of cancer.

This brings us to the question of surgery: So far as cancer is concerned there are three classes of surgery, (a) curative, (b) cosmetic, and (c) mutilating. In cancer of the breast where there is axillary glandular involvement, to my mind the condition is inoperable. It may become operable after proper radiation, but without it the case is inoperable and any surgery under such circumstances would have to be classed as mutilating, and in my opinion criminal.

I would like to ask some of the surgeons present whether they have ever seen a patient cured of breast cancer by surgical removal where there was axillary glandular involvement? If surgery is contemplated in such a case I believe it should certainly not be undertaken until after radiation. It will be found in many instances that the tissues then become fibrosed and operation becomes cosmetic surgery. Mutilating surgery should be no longer considered a legitimate procedure. This is one of the things that has defeated the object sought to be obtained in the treatment of cancer, i. e., let us see all cases early if a cure is to be expected.

If patients suffering from cancer be asked why they did not apply to the surgeon sooner for ex-

amination and treatment I venture to say 75% of them will answer, "fear of operation." They say this because some relative or neighbor has procrastinated until the condition became inoperable, and was then subjected to a mutilating operation with a fatal result. Whenever the surgeon will discontinue mutilating surgery in the treatment of cancer it will be found that patients will apply to him earlier for relief.

Dr. Boggress spoke of the rare judgment necessary in deciding what had best be done when the patient applies for relief. We must decide whether it is a proper case for surgery, radiation, or a combination of both. It is a question of co-operation and discussion between the surgeon, the radiologist and the internist in many instances before concluding what is best for the patient. Dr. Clark, of Philadelphia, recently said there is no case where metastasis has already occurred that is ready for surgery until properly prepared by radiation either by radium or the x-ray or both. If this plan is followed the surgeon will see that his patient will live longer and in greater comfort than has been true heretofore. Surgery without previous radiation may do more harm than good; in fact many cancer patients have passed the stage of operability when first seen and should not be operated upon. However, even in these forlorn cases radiation is often of benefit. They must be given attention either by the internist or the radiologist and their remaining days made as comfortable as possible.

I had the privilege of listening to a foreign gentleman a short time ago at the American X-Ray Society meeting in Washington, on higher voltage (200,000 to 400,000 volts.) He spoke a great deal about high voltage being used in x-ray therapy. At the present time there is considerable discussion among x-ray workers throughout the world on the question of high voltages. Since the advent of the Coolidge tube in 1913, we have been able to use a ten-inch spark gap with what is now classed as low voltage. At the present time it is possible with the high voltage machines to get as much as a twenty-inch spark gap. Dessault, of the University of Berlin, says they were using this method in Germany before the war. I happen to know two or three men who recently spent three months in the various clinics of Europe and their conclusions are that there is a great future for the high voltages. A greater area can be covered as there is a space of twenty inches between the machine and the patient. Many of the x-ray men are also using at present a different method of filtration; that is they are now using 1 mm. of copper as a filter instead of aluminum. The advantage of this may be readily seen when we recognize that $\frac{1}{2}$ mm. of copper is equal to about 14 mm. of aluminum. At first, in this country, we used 2 mm.; later 4 mm.; and this was increased until we were using about 10 mm. of aluminum for filtration.

So far as the dose is concerned in radiation: It requires an expert physicist to determine an accurate dosage. Dessault presented several graphic charts illustrating the depth dose of malignant processes determined by accurate measurements and the dosage required to produce the requisite effects. In this way it is possible to apply radiation to the uterus, vulva, rectum, etc., in a manner more satisfactory than by any other method. The depth of the malignant growth is determined by measurement as so many centimeters beneath the skin, and when the dose is delivered there is no question about the dose the malignant cells are receiving. The lethal dose for malignant cells will vary from 90% to 120% of what the normal skin will stand (average 110%,) but this does not mean that the tumor receives 110% of the skin dose because the growth is located perhaps two inches beneath the skin, therefore the tumor does not receive more than 35% as much as the skin because the structures between the skin and tumor absorb a large amount of the rays. However, by the method of cross-firing and by actual measurements of the pelvis, etc., we are able to determine the depth and size of the tumor and deliver the rays to the involved area satisfactorily, and in that way they have been able to cure a great many cancers. Dr. Stewart said in one of his clinics he asked to see some of the patients they had treated several years ago; he said they mailed ten cards and requested him to return the next Sunday morning and they would show him a few of the patients. He was surprised to find that in response to the ten cards ten patients appeared. They had been the subjects of cancer of the vulva, vagina and cervix; all of them were treated in 1913 or 1914, with high voltage; all of them showed scars as evidence of pre-existing cancer, and all of them were cured.

A question that has arisen at the present time about radiation with this high voltage, is the danger one is likely to incur in a medico-legal way. This is a danger that none of us can afford to ignore. Dr. Stewart said every one of these patients had skin changes, loss of hair, teleangectasis, etc., but they were not worried about it; they had gotten rid of their cancers and fully realized the benefits they had received.

From what the manufacturers tell us about high voltage, and from what I have heard of them in other directions, I believe we will make further progress with the radiation treatment of cancer during the next few years. These high voltage machines are available in this country now. By using greater filtration the skin does not absorb so much of the detrimental rays with these high voltage machines as has been the case with those of lower voltage.

Stewart said of four large clinics which he visited in Europe three of them were no longer resorting to surgery in the treatment of either

mammary or cervical carcinoma; two of these clinics were dominated by radiologists; the largest clinic was controlled by a man who had done nothing but surgery for years; but he had been converted and was now using radiation exclusively.

When a cancer patient applies for treatment we should treat that patient just as we would a member of our own family under like circumstances. We should select the method which will be the easiest and safest for the patient and the one that will cause the least suffering. Mutilating surgery is no longer justifiable and many of these cancer patients will live longer without than with surgery which of necessity incompletely removes the diseased tissues. Radiation certainly gives them a better chance for prolongation of life than the application of surgery in the majority of instances. Until the surgeon improves his methods of operating and increases his percentages of cures in cancer cases he cannot expect patients to consult him early. The laymen are aware of the symptoms of early carcinoma, but are sick of mutilating surgery.

As to small doses of x-ray causing cancer: This may possibly have been true when the roentgen-ray first came into use, but no one who understands anything about radiation is giving small doses at the present time.

E. S. Allen: We have heard some wonderful essays on the cancer question, and the ground has been so thoroughly covered that there is little left to be said.

Much of the discussion has related to the causation of cancer. I hope Dr. Sherrill is right in his theory that the cause of cancer comes from the outside. I noticed in one of the recent journals that the Cancer Commission of Columbia University has been able to develop cancer cells in certain of the lower animals by implanting the eggs of certain worms. I have never been able to abandon the theory, which is as old as the most of us, that the cancer cell under the microscope is identical with the embryological cell common to the structure in which it developed. We know that cancer cells as a rule develop at some point subjected to chronic or constant irritation; this stimulates the cell and causes it to undergo rapid division. Daughter cells divide before growth of the cell is complete and as a result there is a retrograde change which occurs in metabolism, an atavistic tendency, if you wish, until under irritation and stimulation the adult cell again becomes an embryonic cell. An embryonic cell in adult tissue is a cancer cell.

Nearly all the cancers develop at some point of irritation. The theory of irritation in the production of cancer is an old story; there is first irritation, second stimulation, third retrograde change and development of cancer cells.

Another theory which has been applied to the

development of cancer is also an ancient one, i. e., the misplaced or embryonic cell remnant. During the development of the fetus embryonic cells are aggregated or "piled up" in structures which are destined to develop into certain organs, etc. During this process one, two or many cells are cast aside and lie dormant for a varying period of time, usually many years; then as a result of irritation these cells begin to grow. These cells are still embryonic in type and having been separated from the physiological wave development and not governed by the tissues in which they develop, they grow without any governmental force and become lawless cell growth.

As to the treatment of cancer: I believe the x-ray and radium are of great assistance to us in the management of cancer cases. I would not feel that I had performed my whole duty to the patient with cancer to be treated surgically unless I had first applied the roentgen-ray to block adjacent lymphatic areas in the hope of preventing metastasis. I believe in then removing the neoplasm surgically if possible, following the operation by x-ray or radium applications.

As to the cure of cancer by means of the roentgen-ray or radium: I have in mind a woman who came to me about a year ago with an inoperable cancer of the cervix uteri. She was referred to Dr. Keith who used radium. This patient returned for another treatment a few weeks ago. So far as I could determine by examination and inspection she has no evidence of cancer. She had a cauliflower mass involving the cervix, with a foul discharge, and the pathologist made a positive report of carcinoma. Her cervix is now smooth, both broad ligaments are free and movable, and so far as I can determine the patient has no further evidence of cancer.

J. Rowan Morrison: I believe the campaign of education which is now being waged throughout the country in regard to the prevention of cancer will result in a great deal of good. Doctors know little about cancer and of course the public knows less about it. This propaganda will doubtless be of great benefit, not that it will bring to light all of the cancers known to exist, nor will it help us particularly in determining the etiology of cancer, but it may influence patients with breast tumors and uterine hemorrhages, especially those approaching the menopause, to consult physicians earlier than they have heretofore. Such discussions as we have had here tonight will also influence physicians to pay more attention to the subject of incipient cancer and in this way much good will be accomplished.

It has seemed to me that the reported increase in cancer in various parts of the country may be more apparent than real. We must remember that vital statistics have been more thoroughly collected and compiled during recent years than ever before and this may in a measure explain

the increased incidence of cancer. In the New England states, for instance, where cancer seems to be alarmingly prevalent, we know that vital statistics have been carefully compiled for many years. In other sections of the country no vital statistics are obtainable because they are not kept. We had no accurate record of vital statistics in Kentucky until a few years ago. The important question is whether the increase in cancer is apparent or real.

Cancer is a subject which should be discussed and it is the duty of physicians to educate the public in prevention of the disease. In this way no doubt a great deal of good will be accomplished.

W. F. Boggess (closing): The education of the public concerning the cancer problem depends largely upon internists, because we come into more intimate contact with a greater number of people than other medical men. It is the internist who makes the diagnosis and sends the patient to the surgeon, the x-ray man or the radiotherapist. Internists, or general practitioners if you like, are thus purveyors for all of these other specialists. Then after the surgeon or radiotherapist has finished with the patient, we have to handle him to the end and pass him over the line as comfortably as possible.

To my mind the internist is a great factor in the cancer problem. It is our duty to educate the people and to be frank with them in discussing the dangers incident to cancer. We cannot always make an early diagnosis of cancer, but we can truthfully say that a certain lesion is potentially suspicious and advise the patient what to do.

As Dr. Keith has said, doubtless the fear of mutilating surgical operations has deterred many patients from consulting the physician in the early stages of cancer. Oftentimes the physician is not consulted until the disease has reached the inoperable or at least the incurable stage, and under such circumstances the best we can do is to relieve pain and suffering and prolong life so far as we can.

I still think the onus and burden of the cancer problem, and the spreading of the propaganda of prevention rests largely with the internist, as it is the internist who has to handle the problem if we are to do anything in the way of educating the public, in doing away with existing superstition, the sense of fear, and in inducing the people to consult the physician early in the course of the disease. The public must be taught that cancer is not a hopeless disease if recognized and treated early.

Wm. J. Young (closing): Dr. Weidner asked the question whether cancer was ever cured by the application of x-ray or radium: I have only been practicing roentgen-ray and radium therapy for six years, and am not prepared to say that I have absolutely cured a case of cancer. One

of the first patients treated with radium was a woman who had extensive cancer of the cervix with the uterus absolutely fixed in the pelvis and the broad ligaments were also involved. Under radiotherapy the broad ligaments became soft, the uterus became movable, the cervical lesion disappeared, but whether the patient has actually been cured of cancer I do not know. However, I would pronounce her clinically cured.

Some time ago I heard Dr. Haggard, of Nashville, Tennessee, in discussing the subject of cancer, speak of an old lady who had been operated upon by his father for mammary carcinoma twenty-nine years ago, and she then had a recurrence in the axilla. So I am too young in practice to speak with any authority about an absolute cure of cancer; but so far as radium is concerned, if we can only give relief, cause subsidence of the foul smelling discharge and prolong life for three or four years, we are certainly accomplishing something.

In the treatment of precancerous lesions, I believe better cosmetic results can be secured with radium or the roentgen-ray than with the knife. In the majority of instances if radium or the x-ray is properly applied there simply remains a smooth scar which is not unsightly. My idea of a precancerous lesion is one that may eventually undergo malignant change, and under this classification would come moles, warts, hyperkeratosis, papillomata, etc. I recently removed a papilloma from the eyebrow of a patient; this papilloma contained two distinct tortuous blood vessels which had appeared within the last three months. I would regard that as beginning signs of activity with the possibility of malignant development. It is absolutely true, as stated by Dr. Weidner, that we cannot say definitely whether any benign lesion will eventually become cancerous, but I think it advisable to remove warts, moles, etc., especially when located where they are subjected to irritation since we know that under such circumstances they are prone to become malignant. I believe the term precancerous should be applied to all such lesions.

Guy Aud, (closing): As to the matter of vital statistics in the United States which have been quoted here tonight: Many of the states have had no vital statistics until the last few years and some of them have none now; but Germany, France and England have had vital statistics for many years, and their reports show practically what ours do, viz., an annual increase in the incidence of cancer of about 2.5%.

Dr. Fort said cancer was much less common in Africa, India and certain other countries than in the United States: I do not know whether it is or not. It is a question whether cancer is less common there than here, because we know practically nothing of the people in the countries mentioned. Many of them have probably never seen a doctor in their lives, and many may have died

from cancer and there is no record of the facts. We cannot say whether they have cancer in those countries or not because it is not reported, but the probability is they do have it in about the same ratio as in this country.

As to whether cancer is more prevalent in cold than warm climates: Statistics show a higher percentage in the northeast than in the south. In the northeastern states the population is denser the inhabitants of mostly of the white races, there are doubtless many doctors in the thickly populated districts, the people are highly educated, and vital statistics are carefully compiled. The southern states are not so densely populated, there are many negroes living in outlying districts, and we do not know how many of them die from cancer. Fatalities from cancer are probably reported as something else because in many communities there are no physicians capable of making the diagnosis of cancer. Solution of the cancer problem depends largely upon the matter of having a sufficient number of competent physicians, and having people sufficiently educated as to the value of early diagnosis.

There has been considerable discussion whether warts and moles should be removed: If an error is to be made one way or the other, I think we should make the error of promptly removing such lesions especially where they are subjected to irritation. Warts and moles are unsightly and should be removed anyway.

Referring to the work that is being done in an effort to determine the origin of cancer: Dr. Sherrill mentioned the experiments of Ochsner and his associates in Chicago who claim to have isolated the micro-organism which causes cancer. Such announcements have been made several times previously, but nothing has ever been proven. However, this is not true of plant life. Smith has done some wonderful work in reproducing cancers in plants. He has positively isolated the micro-organism and has reproduced cancer in plants in practically every instance. He has reproduced cancer repeatedly by isolating the micro-organism in certain plants and introducing them into others. There is no doubt about the fact that cancer has been transplanted from one animal to another of the same species; that is nothing new. It is well understood that living tissues can be transplanted and made to grow. Cancer tissue can also be transplanted and the tumor thus reproduced.

Answering the question raised by Dr. Keith concerning involved axillary glands in advanced cases of mammary cancer: I do not believe any surgeon would say he could positively cure cancer of the breast by operation where the disease had progressed to the stage of marked involvement of the axillary glands. However, I want to call Dr. Keith's attention to the fact that the presence of palpable axillary glands does not necessarily mean that these glands are cancerous. The

auxillary glands may be palpably enlarged, due to other causes than metastasis. Enlargement of the axillary glands does not always mean cancer of the axilla. No one should make the mistake of denying the patient the benefit of surgery because there are a few palpable glands in the axilla.

Dr. Sherrill made the statement that all cases of cancer are now being diagnosed: I want to disagree with him on this point. He said that doctors were diagnosing these cases as soon as the patients appeared for examination. I do not believe it. Many physicians seem unable to diagnose cancer they can see, and it stands to reason they are failing to diagnose the majority of them they cannot see.

ECTOPIC GESTATION: PROBABLY OVARIAN. CASE REPORT.*

By L. WALLACE FRANK, Louisville.

The specimen I present is a mass, including the Fallopian tubes and both ovaries, the left ovary being the site of a probable ovarian gestation. The patient, M. B., married, aged thirty-four years, is the mother of six children and has had four miscarriages interspersed between the deliveries. None of the abortions were induced. Her family history is negative. She had an appendicectomy performed eleven years ago by a local surgeon.

History of present condition about as follows: Her menstruation has always been regular, three days duration, and always painful. October 10, 1920, she had a normal period. She had no menstruation in November, but in December there was slight vaginal bleeding which she thought was a normal period, but the flow was of short duration.

On December 18th, she began to have pain in the lower abdomen and bloating; she also had some nausea and vomiting at that time. These attacks continued at intervals until about January 10th, when she began to have hemorrhages from the vagina, and the bleeding has continued at intervals until the present time—that is about three days ago.

During January, she passed by the vagina some material which she said looked like membrane and she thought she was having a miscarriage. Left-sided abdominal pain continued until March when it became very severe. She suffered with pain during the entire month of March. I first saw her about the 2nd of April.

Examination revealed a mass wedged in the pelvis; this mass was tender and could not be moved. Based on these clinical findings, we

*Clinical report with exhibition of specimen before the Louisville Medico-Chirurgical Society, April 8, 1921.

made the pre-operative diagnosis of uterine myofibroma. However, at operation we found quite a different condition.

The uterus was about normal in size; the right ovary was about the size of a lemon and cystic. In the left ovarian region was a mass about the size of an orange, and I thought it was a large ovarian abscess. In freeing the mass, it began to "shell out," and finally came away. It was then seen that the left ovary was apparently split open and there was evidently ovarian tissue around the mass lying between the tumor and the broad ligament. We removed this shell of tissue which we think is ovarian, and this will be examined microscopically.

The specimen has been opened and you will note the cavity in which this small fetus (about two and a half months) was lying; the umbilical cord and placenta were well formed and incorporated in the mass. The Fallopian tube had only slight attachments to the upper surface of the ovary.

This is merely a preliminary report, and while I am unable to state definitely that this is an ovarian pregnancy, I believe it to be of that type. And the relations of the structures at the time of the operation seemed to confirm this view. Dr. Stuart Graves is going to study the specimen microscopically, and we will then be able to determine whether or not impregnation occurred in the tube.

Ovarian gestation is exceedingly rare. About once every three or four years somebody reports such a case; but the question of microscopic confirmation arises, and in most reports this is lacking. This case is either of ovarian pregnancy or a tubal pregnancy which aborted and became attached to the ovary and continued to grow.

DISCUSSION:

Sidney J. Meyers: There is nothing that disturbs the obstetrician quite as much as the diagnosis of tubal pregnancy, because in a goodly number of cases he has this anomaly to deal with.

Probably the symptom that gives us the most concern in the early stages of pregnancy is intermittent bleeding, and the question of ectopic gestation has to be considered in all cases of this kind. I am at a loss to know how to make the diagnosis other than by pelvic examination in these cases, because some of the clinical phenomena we usually expect may be entirely absent. Bleeding may occur where the placenta is not wholly attached to the uterine wall, and the pregnancy goes on to a normal termination.

In every case where we have intermittent hemorrhage after the diagnosis of pregnancy has been made, or where the symptoms warrant the diagnosis of pregnancy, we ought to consider ectopic gestation. Sometimes there is sudden pain

in the abdomen and nausea without any bleeding, and we may likewise have rupture without any bleeding.

Leon K. Baldauf: Dr. Tuley and Dr. Meyers know better than I do that there are certain definite rules and laws laid down which have to be adhered to and considered very carefully before making the diagnosis of ovarian pregnancy. It takes a careful microscopic examination before one can be certain of ovarian pregnancy.

From the history detailed by Dr. Frank, I would be inclined to think this was an ordinary tubal gestation with rupture and attachment to the broad ligament. Personally, I have great doubts whether this is an ovarian pregnancy.

Henry Enos Tuley: I have often wondered whether it were possible for ovarian pregnancy to occur. We know that in the evolution of the ovum within the ovary there is a gradual process of extrusion toward the surface of the Graffian follicle, and when rupture occurs there is a small tumor on the surface of the ovary and there would be very little likelihood of adhesion between the ovum and the ovarian surface. It would seem to me to make ovarian pregnancy possible, the ovum would have to be retained in the remains of the Graffian follicle after rupture. I do not see how it would be possible for ovarian pregnancy to take place.

In the case reported, I think it very much more likely to be an abdominal than an ovarian pregnancy. It seems to me the mechanical conditions alone would preclude the possibility of ovarian gestation.

F. C. Simpson: As Dr. Meyers has said, we all see obstetrical cases and it is a very difficult proposition sometimes to make the diagnosis of tubal gestation. Like Dr. Tuley, I do not see how it is possible for ovarian pregnancy to take place.

I remember a case that came under my observation a few years ago in which there was considerable doubt as to the diagnosis. I was called to see a young woman who was then about two months pregnant, according to her menstrual history. She had intense pain in the upper abdomen which had persisted for forty-eight hours. I asked Dr. Louis Frank to see the patient in consultation, as I did not know whether it was a case of ectopic gestation or not. He thought the trouble might be either in the gall bladder or the appendix, either of which might produce the same character of pain. We had Dr. Baldauf make a number of blood counts, and there was considerable leucocytosis (about 20,000.) Dr. Frank decided that operation should be performed without further delay. The operation was accordingly performed and a tubal pregnancy found. The abdomen was filled with blood. There had never been any vaginal bleeding in this case.

Louis Frank: With reference to this particular case: I think the whole question here would be one to be decided by the pathologist. As Dr. Baldauf has said, to establish ovarian pregnancy, certain definite conditions must be met. It has been proven beyond any doubt that ovarian gestation may occur.

As Dr. Baldauf has said, these cases are exceedingly rare, and certain definite rules must be established. So far as we know from a pathological standpoint there has been no case of primary abdominal pregnancy reported. Many cases of secondary abdominal pregnancy have been recorded. In such cases gestation occurs primarily in the tube, or possibly in the ovary, rupture occurs with partial extrusion and outgrowth of the placenta in the abdominal cavity, and from that time on the pregnancy is abdominal in type.

Primary ovarian gestation have been proven, but to prove this there must be certain definite things established. In the case reported it would be impossible, from the specimen, to furnish this fact, and under the circumstances I think it would be hardly fair to report this case as a primary ovarian pregnancy, because such a contention cannot be maintained. To prove the existence of ovarian pregnancy, the tube must be intact and ovarian tissue must be found in the sac wall. These cases must be differentiated from primary tubal pregnancy where the sac has been partially extruded from the fimbriated extremity and become attached to the surface of the ovary. Such cases cannot be classified as ovarian pregnancy. The case reported may be one of that type. No one is justified in pronouncing it a case of ovarian pregnancy without careful pathological examination.

Ovarian pregnancy does occur, but it is exceedingly rare. I take it from examination of the specimen, and as the report is made, that this is probably a primary tubal pregnancy in the fimbriated end which has become attached to the ovary and it may therefore be classed as a secondary ovarian gestation.

L. W. Frank: There were a good many adhesions between this mass and the intestine, and of course, these had to be separated before we could enucleate the tumor. In bringing the tumor out of the cavity the tube was brought with it. At the time I thought it was probably a tubo-ovarian abscess.

The mass was firmly attached to the ovary and the posterior surface of the left broad ligament. Whether the sac will show true ovarian tissue when examined pathologically, I cannot say. When the mass was opened after being removed from the cavity, I was certain it was an ovarian pregnancy. Whether the pregnancy was primarily ovarian or tubal it is impossible to determine. A small piece of tissue removed

from the side of the mass, about 5 x 5 cm., is certainly ovarian tissue, and on the surface several unruptured Graffian follicles are evident.

Stuart Graves: My impression is that this mass, which appears to be placental tissue, is very much larger than I have seen in any other ruptured ectopic gestation. The specimen was brought down by one of the internes, who said that Dr. Frank had made the diagnosis of ovarian pregnancy. The specimen was in four parts. This mass, which contained the fetus, was entirely separate from the other portions of ovarian tissue and tube. Apparently one piece consisted of the tube and ovary of the other side. Another piece was the greater portion of the opposite tube which was wedge-shaped and covered with a mass of adhesions, the distal end being blunt and looked as if it might be the fimbriated extremity of the tube matted together in organized tissue.

As soon as the interne said the diagnosis had been made of ovarian pregnancy, I told him we would not touch the specimen until Dr. Frank had a chance to come to the laboratory. Of course it was important not to further disturb the relations until we knew more about the specimen.

The question to be first determined, it seems to me, is the exact relation of this fetal mass to the club-shaped end of the tube on that side. I am inclined to think the opinion expressed by Dr. Louis Frank is correct; i. e., that this was an ectopic pregnancy which had ruptured toward the fimbriated end of the tube and becomes attached to the broad ligament and surrounded by a mass of tissue in part of ovarian origin. But even if this sac should show ovarian tissue, I do not believe that would prove ovarian pregnancy, because the ovary might have formed part of a wall about a secondary abdominal pregnancy.

High Frequency Current in Urinary Surgery.—Heitz-Boyer for ten years has been seeking to improve the technic and extend the fields of this method of treatment. In certain cases it permits the destruction at a single sitting of large hypertrophied lobes of the prostate, or the liberation of a calculus in the terminal ureter, or the cure of tuberculous ulceration in the bladder after nephrectomy, or the electric curettage of cystitis, or the cure of any and every subacute and chronic lesion in the urethra, including polyps and inflammatory pseudopolyps. Some of his patients have been cured for nearly ten years to date.

CASE OF CARDIOSPASM IN A THREE-YEAR-OLD CHILD.*

By JAMES W. BRUCE, Louisville.

Cardiospasm is a spasm of the smooth muscle fibers surrounding the cardiac valve of the stomach, resulting in partial or complete occlusion of the lower end of the esophagus. It is a functional disturbance of neurotic origin and no pathological change is found in the structures involved. Cardiospasm is a rare condition among adults and much more so among children. In fact none of the standard text books on diseases of children even mention the condition. Among adults it is being more and more often recognized due to the use of more accurate and careful diagnostic methods. However, there are not many cases on record, the largest series that I have ever seen being the report of 100 cases of cardiospasm by Dr. J. Russell Verbreyche at the 1919 meeting of the Southern Medical Association at Asheville. This report and the discussion following it comprise by far the most complete and illuminating work on the subject I have ever found.

The etiology of cardiospasm can be conveniently divided into four groups.

1. Those due to a neurotic constitution or to a prolonged nerve strain, or severe emotion. I think the case reported hereafter falls under this heading.

2. Those due to reflex causes, such as chronic appendicitis, gall bladder, pelvic disease, etc.

3. Those due to local irritation, such as fissure or local abrasion.

4. Those due to toxic causes, i. e., following influenza or pneumonia, or associated with hyperthyroidism.

Most observers agree that it is a disease of middle life, and rarely seen before the twentieth year (2).

The symptoms are: difficult and usually painful swallowing, and vomiting or regurgitation of undigested food. In severe cases of long standing there is always some dilatation of the esophagus above the spasm, and food may be vomited which was eaten two or three days before. In extreme cases there is great loss of weight from starvation.

The diagnosis is best made by obstruction to the passage of a stomach tube or bougie, and by the X-ray. Usually the spasm will relax and allow the instrument to pass, but it is dangerous to use pressure in these cases unless the instrument is threaded over a strong silk thread because of the possibility of making a false passage (3). The X-ray is our best aid

in diagnosis and in the case here reported gave a beautiful demonstration of the condition. Under the screen the lower end of the esophagus can be plainly seen curving symmetrically and smoothly to a point, and resembling nothing so much as a miniature of the business end of a high explosive shell. In long standing cases with dilatation of the esophagus, several pints of fluid may be contained in the distended sack.

TREATMENT.

The milder cases and especially those with no dilatation of the esophagus usually respond to medication with antispasmodics. Of these belladonna and benzyl benzoate head the list and should be given in massive doses. In the more severe cases, medication is not sufficient and mechanical dilatation with water or air bags is necessary. The dilators are difficult to handle and the work had best be done by some one skilled in their use. In the worst cases, gastrostomy may be necessary to feed the patient.

HISTORY.

Family History. Negative.

Previous History. Ever since the child was born, it has had attacks of "choking" when it attempted to take food. The first one occurred a few hours after birth and for about a year, it had one or more attacks every day. Since it was a year old, the attacks have been less frequent until now at 3 years it only has one once or twice a month. At first the choking was accompanied by cyanosis, but for some time past, there has been no cyanosis. The attacks are not as severe as formerly. The choking begins after a few mouthfuls of food have been swallowed. It never occurs independently of the taking of food. The first few mouthfuls go down all right. Then the child complains of a pain in his stomach (puts his hand over the ensiform region when asked to localize the pain) and begins to cough. The cough becomes more and more violent and finally he vomits, bringing up the food which he has just swallowed and a great quantity of stringy mucus. After vomiting he is relieved, the coughing stops immediately, and usually he can proceed to eat food. Sometimes the resumption of eating brings on a second attack. As a result of these spells, the child has been fed irregularly and this irregular feeding is probably the cause of the chronic intestinal indigestion from which he is suffering at present.

He has never had any contagious diseases. No surgical operations or serious injuries. Is usually constipated.

Present Illness. The child was brought to me because of the large size of its abdomen and because it always had gas on its stomach

*Read before the Jefferson County Medical Society.

and bowels. It was quite constipated and had to have cathartics at frequent intervals. Because of the large abdomen and constipation, a diagnosis of Hirshprung's disease or enlarged colon had been made about a year previously, but X-ray plates taken at the time failed to show any unusual dilatation of the colon. The child had always been weak and poorly nourished, although it had a fairly good appetite, and the mother wanted to see if something could be done to improve his general health and nutrition.

PHYSICAL EXAMINATION.

Physical examination showed a poorly nourished, but fairly developed boy of 3 years. His color was pale and his mucous membranes were pale. His muscles lacked tone and seemed to be weak. Otherwise the examination was negative except for the abdomen. This was greatly distended. It was soft and tympanic and there were no masses or tenderness anywhere. Liver was palpable 2 cm. below the costal margin; spleen was not palpable. Temperature, pulse and respiration were normal.

SUBSEQUENT PROGRESS.

A diagnosis of chronic intestinal indigestion was made and treatment was started to correct this condition. Chronic intestinal indigestion is due in most cases to inability to digest carbohydrates and to some extent also fats. The treatment, therefore, is to put the child on a diet consisting almost entirely of protein and then gradually add fat and later carbohydrates. It is a long tedious process and takes months and sometimes years. A diet, therefore, was prescribed consisting of eggs, albumin water, meat broths, meat and buttermilk. The child rebelled violently against this diet. He did not like any of it. He would not drink buttermilk except in very small quantities and cried constantly for other foods. About the fourth day on this diet he had one of the "choking" attacks which his mother had described in his previous history. I witnessed one of the attacks and will attempt to describe it. On being given a glass of buttermilk, he took two or three swallows without difficulty. Then he began to cough. The cough grew more and more violent until after three or four minutes he vomited all the milk he had swallowed and a great deal of mucus. The milk was unchanged and did not have the sour odor of gastric contents. From this we reasoned that it had never reached the stomach. Therefore, since the milk had apparently been swallowed without difficulty, the trouble must be located in the esophagus.

The choking attacks rapidly became more frequent until within a few hours, no food

could be swallowed at all and we begun to be uneasy as to his general condition and as to the possibility of the development of a condition of acidosis. He could swallow nothing fluid or solid.

A tentative diagnosis of spasm of the esophagus was made and he was taken to Dr. Keith for radiographic examination. Under the fluoroscope the most beautiful demonstration of cardiospasm was made that any one would want to see. The child was given a mixture of barium and milk to drink. The first swallow shot through the esophagus into the stomach in a normal manner. The second swallow hung for an instant in the lower end of the esophagus and then it too fell into the stomach. After that the cardiac orifice of the stomach closed and no more of the mixture passed there. As the mixture was swallowed, the esophagus filled just as a test tube would fill if water were poured into it. When the esophagus was about two-thirds full, some of the mixture evidently got into the larynx and the child began coughing and in a few minutes he vomited the entire contents of the esophagus. All the steps in this procedure could be plainly seen in the uroroscope. A definite diagnosis of the cardiospasm was made.

The problem now was to relax this spasm. It was decided to try drugs first and if they failed to use mechanical dilatation. An engagement was made with Dr. Gaylord Hall for the following morning. The spasm had now refused to allow anything to pass into the stomach for about eighteen hours and the child was very weak from hunger and the physical exertion of choking and vomiting. Atropin was the first drug tried and was given up to the physiological limit, that is flushing of the face, but still the spasm persisted. Benzyl benzoate (20% solution in alcohol) was given in 15 drop doses every hour along with atropin gr. 1-500 by mouth. I saw the child after about three doses had been given. He was given a glass of milk and drank it slowly, coughing once or twice but not vomiting. He then ate some cereal with out any trouble. After this there was no return of the spasm. The benzyl benzoate and atropin were gradually cut down and discontinued after three or four days. He did not have a recurrence of the spasm in the next two weeks, after which he left the city. Needless to say, the restricted diet was discontinued after this experience and he was allowed to eat what he wanted within reasonable limits.

CONCLUSIONS.

I believe that this attack of cardiospasm was induced by an emotional state due to

being forced for three days to eat food that he did not like and not being allowed to eat food that he did like.

Benzyl benzoate and atropin were able to relax the spasm.

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DISCUSSION:

George A. Hendon: I have had occasion to deal with probably half a dozen cases of cardiospasm, but have never seen one in a child so young as that reported by Dr. Bruce.

I am not an advocate of the neurotic or emotional theory in the causation of cardiospasm. I believe there are but two causes, one in irritation and the other ulceration. The effect of irritation or ulceration on the circular fibers of the cardiac orifice of the stomach is to produce spasmotic contraction. Similar conditions are noted at the rectal and vesical outlets from the same cause. These patients get well or improve when the irritation is removed or the ulceration cured. For instance, if we employ means to stretch the circular fibers at the cardiac orifice the patient recovers promptly from the cardiospasm, just the same as if you stretch the rectal sphincter muscle the ulceration subsides without any further treatment and the patient is cured.

I saw one patient with cardiospasm, the first case I have even seen of that kind, where the lesion was acquired in a very unusual way. The man was taking a drink of water from a hydrant and the water under pressure "shot down his throat" with considerable force; he immediately fell unconscious. When he regained consciousness he could not swallow and continued in that way for quite a long time. He had a gastrostomy performed by the late Dr. A. M. Cartledge and later died of mural digestion.

I recall one case in a middle-aged woman from the mountains of Kentucky who was the most tranquil individual I have ever seen. She had chicken for breakfast, and when she tried to swallow a bite of chicken her throat closed. For three days she was unable to take any nourishment. She was cured by the passage of an olive bougie.

There is never complete closure of the esophagus and the plan of having the patient swallow a string, as introduced by Plummer or at least practiced by him, is a most valuable procedure. Have the patient swallow about eighteen feet of silk thread. (I use Pagenstecher linen) and it is very simple to thread a bougie over this string and pass it beyond the cardia into the stomach and bring about a relative degree of dilatation. Very often one passage of the bougie will bring about a cure of the cardiospasm. If, however,

the case proves intractable, one may resort to the water apparatus of Plummer. This is a very simple affair; an inflatable rubber bag attached to a whalebone staff is introduced through the cardia into the stomach and the bag then distended by water pressure which dilates and paralyzes the circular muscle fibres and the patient is well.

I believe cardiospasm is always due to a local condition, the presence of irritation or ulceration in the cardiac end of the stomach; there is nothing in the theory of neurosis or the influence of toxic agents; it is purely local and the cure is quite simple.

Frank T. Fort: The case mentioned by Dr. Hendon in which cardiospasm developed suddenly does not quite agree with one that I had a few years ago. I was asked to participate in a symposium on Stricture of the Esophagus at the Jefferson County Medical Society, and reported a case of cardiospasm in a man aged forty years. For six months that man had noticed the cardiospasm developing. At last when he came to me he was unable to swallow water. He had been in this condition for three or four days. He was very much emaciated and it looked as if something had to be done at once to save his life. I did a gastrostomy so that nourishment could be given him. He was then made to swallow a string and the Plummer dilator was used carrying the pressure to about fifteen pounds. I used the dilator for six or eight weeks at weekly intervals, then the gastrostomy was allowed to close and he made a perfect recovery. That was about ten years ago and the man has had no further trouble. I was under the impression at the time that this was purely neurotic in origin; but the man became progressively worse and something had to be done promptly to save his life. I have seen several cases of this character. The Plummer dilator is one of the best instruments I have ever seen for use in the treatment of such cases.

M. Casper: I disagree with Dr. Hendon about cardiospasm being reflex in origin. We know, as a matter of fact, that the pyloric end of the stomach is often the site of reflex spasm, and I believe it is oftener reflex than organic. Everyone who does x-ray work has seen cases of this kind, and many of them are due reflexly to appendicitis and other diseases.

The differential diagnosis between organic and reflex spasm is easily made by the administration of belladonna. The physiological action of belladonna will relieve reflex spasm. We also see quite frequently cases of food retention where there is no local lesion. This is especially true in toxic conditions following serious operations, shock and other conditions which are largely reflex in nature. I do not see why cardiospasm should not be due to some reflex condition.

J. W. Bruce, (closing): With regard to the question of whether cardiospasm is due to local

injury or is reflex in origin: I think that is a difficult question to decide in all cases. Undoubtedly a great many cases of this kind are due to local ulceration, injuries, the swallowing of irritating foods, etc., but there are many cases where the presence or absence of spasm is closely related to the mental condition of the patient. For instance, I saw one case reported where the patient stated that so long as his business affairs were running along smoothly he had no trouble, but when he became mentally or emotionally worried he could not swallow. I think that was the cause of the trouble in the case I have reported; the child was in a tantrum for four days; he craved things which he was not allowed to eat. The fourth day the spasm became complete.

In my opinion many of these cases are due to reflex conditions or to neurotic influence. Undoubtedly there are also many due to local ulceration or injury.

IMPERFORATE ANUS: CASE REPORT.*

By JOHN R. WATHEN, Louisville.

The embryological defect noted in the superscription hereto is of sufficient rarity to warrant the report of a case with consideration of the various types of the abnormality and their surgical treatment.

The patient, a girl baby seven weeks old, was brought to me by the family physician, who stated that the defect was not discovered at birth, but in a short time when the usual defecation occurred the mother noticed that feces seemed to be discharged with difficulty from a very small vaginal opening, that there appeared to be entire absence of any opening into the rectum, and only a ring of muscle fibers with a skin covering in position of the normal anus. At each effort to defecate the occluded anus would bulge forward with the extrusion of only a small amount of feces through the vagina, and this only after repeated doses of castor oil. Finally there accumulated sufficient feces to cause impaction in the dilated rectum, and the baby was brought to me for surgical relief.

Upon examination we found a small recto-vaginal fistula located about one centimeter above the vaginal opening and about half a centimeter in diameter through which feces with difficulty tried to escape. By introducing a curved probe through the fistula and forcing the rectal pouch downward toward the anus we were able to bring the tip of the instrument to within about half a centimeter of the skin covering the intended anal orifice.

The little patient was anesthetized with nitrous oxide and oxygen (without ether)

and the skin and subcutaneous tissues divided to the dilated rectal pouch, the latter was then grasped with tenaculum forceps and pulled downward and opened, allowing the escape of considerable impacted feces.

After properly cleansing the parts we decided to dissect the rectum free from the vaginal wall and surrounding tissues so as to permit suture of the mucous membrane to the anal sphincter and the skin, at the same time bringing enough of the rectal wall downward and outward to allow the opening of the former rectovaginal fistula to be removed. This latter procedure was suggested by an operation devised by Dr. Hugh H. Young for the cure of urethrorectal fistulae following perineal prostatectomy. The baby made a nice recovery and is now defecating in the normal way.

I shall take this opportunity to briefly call attention to the most common types of imperforate anus which are met clinically and illustrate them by lantern slides.

Bevan, in *Chicago Surgical Clinics*, February, 1920, says: "The simplest type is where the rectum is quite complete, except that it is closed off from the external skin at the anus simply by a thin septum of skin and mucous membrane."

"The second type is one in which the rectum ends blindly, but well up in the pelvis, an inch or more from its normal position."

It is possible, too, in these cases by dissection, to bring the blind end of the rectum down and unite the rectum to the skin in the normal position of the anus."

"Another type is the one in which the blind end of the bowel connects with the bladder or with the vagina."

"Where the bladder and rectum form one general cavity, so that feces are extruded through the urethra, it is imperative to give the child relief by colostomy, and very early to separate the bladder from the rectal cavity and so prevent death from ascending nephritis."

DISCUSSION:

Bernard Asman: Congenital defects about the rectum and anus are found perhaps as often as developmental errors in other parts of the body. It is estimated that there is one case of imperforate anus in every ten thousand births.

It may be interesting to note that Bodenhamer called particular attention to this congenital defect and collected 287 cases in about 1860. In his report he stated that the anomaly had been recognized by Lusitanus in the seventeenth century and had been described by Greek and Roman physicians hundreds of years prior to that time.

The classification mentioned by Dr. Wathen is generally accepted. However, he did not mention

one defect, i.e., a simple congenital narrowing of the rectum or anal canal without complete occlusion. This may cause the infant to experience considerable difficulty in trying to force feces outward through the opening. This type is easily remedied by either incision or divulsion of the small opening.

In the second type, where there is closure of the anus by a membrane of tissue, the remedy is also simple, viz., the anus is merely opened by making an incision. In this type the child is unable to defecate, the thin membrane occluding the anus, and it is easily remedied by perforating the membrane and restoring the anal outlet.

The third type, that in which there is entire absence of the anus the rectum ending in a blind pouch, is one more difficult to handle and to secure favorable results the defect must be recognized early. In this type the rectum ends in a blind pouch without any communication with other viscera.

The fourth type is one in which there is an imperforate anus with a fecal fistula,—this being the type mentioned by Dr. Wathen. In this form the fistula may enter the vagina, the bladder, or the urethra. The symptoms will depend somewhat upon date of recognition of the defect, and the prognosis likewise depends upon the time treatment is instituted.

In the first type (congenital narrowing), the prognosis is universally good, and this is also true in the second type (membranous closure) and certain cases of the third type (absence of anus.) In the majority of the third type, however, where there is entire absence of the anus and portion of the rectum the latter ending in a blind pouch, the condition is difficult to handle and the prognosis is rather grave. Much depends, of course, upon the amount of tissue intervening between the blind rectal pouch and the surface. It is in this type we encounter the greatest difficulty because it is practically impossible to know just where the rectum is. In making dissection endeavoring to find the end of the rectum one is likely to encounter difficulty and in some instances it may be impossible to find the rectum. I have seen a few of these cases, and it has seemed to me one of the greatest aids in determining the location of the rectum is to place the hand on the abdomen of the child and make pressure while palpation is made over the anal region. Very often the tissue intervening between the blind rectal pouch and the surface is not great and by localization in this way dissection is greatly facilitated.

Those cases in which fistulae exist, as Dr. Wathen has stated, I think can be handled in no better way than he has described. Satisfactory results have been obtained by proctoplastic surgery in many cases of this kind. Of course much will depend upon the time the malformation is recognized. In those cases wherein an opening cannot be made at the normal site colostomy be-

comes imperative. Colostomy in the infant is no more serious than in the adult. One objects very much to performing colostomy on an infant, but if the child is to live to adult life the necessity of having a colostomy is clear. Moreover, the manner in which colostomy is made nowadays, giving the patient comparative comfort and satisfactory control of the opening, renders the situation much less disagreeable than in former days under the older methods. It will be remembered that in former operations no attempt was made to provide means of controlling the colostomy opening and the condition following such operations was not as good as after colostomy of the present day.

E. Dargan Smith: I have recently had under observation a case of imperforate anus which would come under the third division of the classification stated by Dr. Wathen. Dr. Wathen asked me to exhibit some drawings which I have of this case in connection with his report. I expect to embody the clinical, operative and autopsy findings in a forthcoming paper. The child had three distinct malformations: (a) atresia of the rectum, (b) atresia of the duodenum, and (c) a malformed and displaced left kidney.

The treatment of this type of imperforate anus is not especially difficult unless the rectal pouch is located very high. By making the incision about one-fourth inch from the anal dimple toward the coccyx no important structures are encountered in the dissection and the operation can be completed without special difficulty. The rectal pouch is not opened until the original incision is closed and smeared with a protection of zinc oxide ointment.

In the case I have mentioned the rectal pouch was found one and a half inches from the surface. No trouble was experienced in bringing it downward and completing the operation. The child died a few days later, and at autopsy the causative congenital defect (atresia of the duodenum) was found. The entire intestinal tract was filled with thick meconium showing the atresia had occurred above the ampulla of Vater.

Puncture of Longitudinal Sinus.—Krasemann did not hesitate to withdraw up to 40 or 80 c. c. of blood to relieve high pressure in the lesser circulation in some cases. As a rule, however, 8 to 10 c. c. was the limit. The procedure has been applied 300 times to date at the Rostock children's clinic, including his own 250 cases. The original suggestion to obtain blood in infants by puncture of the longitudinal sinus he attributes to Marfan, 1914, but numerous writers have reported its use since, and none mention any injury therefrom. His own experience with it has been favorable, but he adds that it had better not be attempted outside of the clinic at present.

SOME CAUSES OF HEADACHE AND
THEIR TREATMENT.*

By W. J. THOMASSON, Newport.

Pain, it matters not where located, is a symptom and not a disease. This is true of headache.

Pain localized in the head or brow may be due to many causes. The two most frequent causes of headache are, either eye strain or some pathological conditions within some of the accessory sinuses. It is these two causes of headache which we will consider tonight.

Refractive errors are blamed for many discomforts which do not exist. On the other hand patients are treated for headache and other pains that are caused by some refractive error and the pain does not disappear until the eye strain is relieved by proper lenses.

Many patients wearing glasses have no eye strain but thinking the headache was due to the eyes, or that shell mountings looked rather becoming, spend good money for lenses that are practically worthless, or in other words, have no more refractive power than so much window glass.

Others with normal vision for distance, but presbyopic, will come in with bifocal lenses because the optician has recommended the double glass that they may wear them constantly, not realizing the fact that the glass for distance is not necessary, and that the lower segment for near work gives them but a small field for their work.

Should all headaches be due to eye strain or sinus conditions, cures would be many and rapid. You all know that many pains located about the head are due to other causes, and I hope in this paper to bring out a few points that may help you to distinguish between pain due to other causes than the two mentioned.

It is not unusual to have a patient come into the office with headache, his diagnosis made that he needs glasses and on examination to find that the vision is normal but that one or more of the sinuses are involved. Just a few weeks ago a high school boy came in for refraction. On examination the ethmoid was found diseased. As soon as the sinus was drained, the eye symptoms cleared.

Just last week an elderly gentleman came in with the history that his eye had been inflamed for several weeks. His doctor gave him eye drops, but the pain had become so severe that he was unable to sleep. The eye was inflamed, the lids swollen and an emphysema existed in the soft tissue around the eye.

Examination of the nose revealed a very

large middle turbinate, blocking the nares and pus coming from the ethmoid. In twenty-four hours after the draining of the ethmoid the man was comfortable and the swelling of the soft parts had disappeared.

Within the last year two girls, both colored, came under my care, with the history, since being fitted with glasses by an optician, they had lost the sight in one eye. Both had ethmoiditis. One was operated and the sight returned on the fourth day. This girl had a positive Wassermann and became perfectly well under salvarsan. The other refused operation and disappeared from observation. In these cases an early diagnosis is important, for later the optic nerve may be involved, causing total loss of sight.

It is not the greatest amount of refractive error that causes the most discomfort. In other words, the individual with one-fourth diopter of astigmatism with a sensitive eye and a high nervous tension may suffer much more than the one with two or three diopters. A slight error of refraction may almost incapacitate the individual for work, causing headache, vomiting, nausea and prostration.

Higher the degree of the refractive error, less the strain on the nervous mechanism of the individual. He may have only 50 per cent vision—may not be able to recognize a friend across the street—yet have no headache or nervous symptoms. These individuals have great trouble in doing their work and if it be a child, he will not progress in school nor will he engage in the outdoor sports, for his vision is so low that he prefers to remain in a passive state as much as possible.

These are the cases that take to their glasses; life becomes a rosy hue and the backward child moves along with his class, the adult discovers new fields of usefulness and happiness.

Many of the old fashioned sick headaches, or the individual that has headache or sick stomach following a day's shopping or a ride on the train or in an automobile, has a refractive error that when corrected he will enjoy these pleasures without the dread of becoming ill every time he goes on a journey or shopping.

Many of these cases not only have a refractive error, but have a pathological condition of the sinuses as well, and when these two conditions are associated, the sinus pathology should be cleared first; then the proper lens prescribed for the patient, for many times the lens that the patient accepts, while suffering from the sinus condition will be rejected after the sinus trouble has cleared.

Many young individuals with a small error of refraction refuse to wear glasses, pre-

*Read before the Campbell-Kenton County Medical Society.

fering the discomfort of headache and other inconveniences to the trouble of learning to use their correction. They claim to see as well without the correction as they do with it and I believe they are correct as far as seeing is concerned, for their accommodation is good and it compensates for a while, but sooner or later the accommodation fails and the discomfort is so great that they are glad to again try the proper lens. Usually when this time comes, examination of the eye reveals that the eye has suffered from the strain and a stronger lens is required than if the proper lens had been worn at the beginning of the eye strain.

Some patients tell you that they do not want to begin wearing glasses for they will have to continue. This is true, for if they have a visional defect it cannot be cured, and the proper lens is necessary for the welfare of the patient. You can rest assured that when one discards their glasses they either did not need them in the first place or they have stopped using their eyes, or they are straining their accommodation, and later will have to return to wearing a much stronger lens than if they had continued with the proper correction.

The presbyope usually has good distant vision, but when he reaches forty or forty-five he notices that he must get his paper further from him or get the light between him and his paper before he can see. Others will read in a good light for a while and then everything is blurred and they begin to realize that they must have help. These are the cases that usually go to the optician and try on glasses until they choose the ones that seem to give them the clearest near vision. Usually they choose the glass that magnifies, or in other words, a glass that is too strong for them and after trying to use them the eyes burn and tire easily, and they must remove the glasses every few minutes to rest the eyes.

Again, some of these cases have much less than normal vision for distances, but they refuse to have the far point corrected and are satisfied to be able to see close work and read, preferring not to bother with two pair of glasses.

You may ask why the middle-aged individual calls for help for close work. The reason is that the crystalline lens loses its elasticity, is unable to accommodate and the loss must be made up by adding strength to the correcting lens.

About the time that one becomes a presbyope, glaucoma also may make its appearance. Tension will be increased, headache troublesome, vision will be low, colored circles will appear around the light, cornea may be

smoky and loses its reflex, the patient complains that his lenses must be changed every few weeks. The headache, worse in the daytime, disappears at night, or when the patient retires to a dark room. These are the symptoms that spell doom for the individual, and as it is the family doctor that sees these patients early, they should be on their guard, for an early diagnosis may be the means of saving the sight. If overlooked, it not only means much suffering, but in many cases total blindness.

These are the cases that mydriatics are contraindicated. One drop of atropine in the eye of a middle-aged patient may bring on a glaucomatous condition that will cause the loss of the vision.

In refracting the presbyope, lenses should not be ordered until the fundus has been examined with the ophthalmoscope, the tension taken and the physician sure that glaucoma does not exist.

The prognosis of glaucoma is always serious and the earlier the diagnosis the better the prognosis. A late diagnosis means the loss of vision, much suffering and discomfort,

Myopic individuals, or near sighted patients do not have the discomfort that the hyperope or far sighted patient has, for he is able to do his close work, and as he has not learned to focus for distance he does not strain his accommodation, consequently his headaches and nervous system are far less than the hyperope.

The near sighted person should be encouraged to choose that work of life that is the least trying on his vision, for myopia is progressive and the eye should be favored by as little close work as possible.

Another condition that is prevalent is cross-eye or strabismus. Some of these cases suffer with headache, but nine out of ten seek the doctor for the cosmetic effect and not for their vision. Few cross-eyed patients have any practical vision in the crossed eye. Many of them reach adult life before they discover that they are practically blind in the bad eye.

These are the patients that should be refracted early so that the weak eye may be trained to focus and the muscles strengthened by the wearing of proper glasses. When is the time to refract these children? I would say the earlier the better; most children can be handled from two to three years of age, and the earlier the treatment the better the results.

Should these cases be operated? The operation does not prevent the child from having to wear glasses, but it does correct to a

certain extent the cosmetic effect; but in many cases after the shortening of the muscle, the opposite muscle has to be shortened or lengthened to overcome the first correction. Glasses will do all that is necessary in these cases, and I believe will prove more satisfactory than the operation for the majority of these children.

In prescribing lenses for the presbyope, care must be taken to give the patient the lens that he may use with the greatest comfort in his work. For instance, the shoe salesman, he must have a lens that will permit him to look at the numbers on his boxes on the shelves above his head, and again, he must be able to make out his ticket or see the price mark on the shoes. This glass will not be satisfactory for him to read his paper, but he requires a glass stronger for his reading. The individuals that have never worn glasses usually will not accept their full correction at first, and it is far better to fit them with a weaker lens for a few months and as their accommodation becomes accustomed to the glass, then a stronger lens may be worn with comfort.

Many patients cannot understand why they are unable to get a lens that they are able to see at a distance with, and also do their close work. This is possible in the young individual because the human lens is able to accommodate. But after forty or forty-five, the human lens loses its elasticity; it cannot accommodate and the lens that is ground is just a piece of glass that has so much refraction and no more. In other words, the lens ordered has not the power of elasticity, but a fixed focusing strength.

The bi-focal lens is a double lens, either ground in one piece of glass with the distant vision above and the close segment below; or, the distant lens is a complete lens with the near correction cemented as a segment at the lower margin of the glass.

This lens is convenient where one must wear two kinds of lenses, but many cannot get used to this lens and many, in going down steps, cast their eyes down, look through the strong or close work segment, the vision becomes fogged and the patient falls.

Others with a high nervous tension are aggravated by this lens, their headache is increased, nervous symptoms are present and a general discomfort is experienced whenever the eyes are used. These symptoms are relieved as soon as the bi-fovals are removed and two pairs of lenses used instead.

Who should wear nose glasses? First, the nose must be right; second, the eye must be clear from astigmatism. An astigmatic individual should not try nose glasses, for they

cannot center the lens, and the axis will not be true. In other words, all individuals with astigmatism, especially those with a sensitive eye and a low degree of astigmatism, should wear spectacles. It is just as essential to the success of the patient to have the frames properly fitted and the lenses properly centered as it is to choose the proper lenses. Otherwise, it matters not how much pains you have taken with your findings, the work will have been in vain.

Headache due to sinus involvement is always different from that due to eye strain. In eye strain you get a history of the pain coming on after the use of the eyes, such as after a shopping jaunt, a long ride in the bright sunshine, or after an evening spent at the theatre. This pain is always relieved by resting the eyes or on retiring. Pain due to eye strain never bothers the individual during the sleeping hours. Many are free from pain until ten or eleven in the forenoon, and these that suffer all week, on Sunday are free, if the eyes are not used.

The pain due to sinus involvement is just the opposite. You may or you may not get a history of head colds or grippe. It may be that the patient has been out for a long automobile ride on a windy day, or the woman has been cleaning windows or has hung her clothes in the yard after doing her washing without a wrap or head covering.

Again, you may get no history of exposure or cold, but the headache is present, especially on using the eyes. They may complain of diplopia or double vision, the pain lasting all night as well as during the day; worse on getting up in the morning. They will complain of dizziness, pressure about the forehead and behind the eyes. The pain usually is better for a few hours after the patient gets up in the morning, due to the sinus emptying its secretion after the patient assumes the upright posture. The pain may radiate to the region of the mastoid or down the shoulder, or it may be localized in the posterior part of the skull, especially if it is the sphenoid that is involved.

The pain due to a diseased sinus is always more severe than that due to eye strain, and more persistent. It is more of a neuralgic character, and the ordinary remedies for headache give little or no relief. Tenderness at the inner canthus of the eye is indicative of ethmoiditis, especially is this true if pus is found in the nose. Pain on pressure under the orbit and to the inner canthus made backward and above, may mean frontal sinusitis.

Pain over the cheek in the region of the maxillary sinus on pressure indicates an involvement of the sinus. Usually more than

one sinus is involved and the symptoms may be complex and at times it is hard to say just how much pain in one locality is due to a certain sinus.

In many of these sinus cases the destruction of bone is very rapid and at times you are able to get the odor of decaying bone which always means that you have trouble in the ethmoid at least.

A large number of patients with chronic sinus conditions have marked eye symptoms. I mentioned some of these conditions early in this paper. Some of these symptoms are due to pressure behind the eyeball by the formation of pus within the sinus necrosis of the bony orbit and the extension of pus to the soft parts around the eye.

If the sphenoid is involved, you may have pressure by the pus direct on the optic nerve or the inflammation may travel by the way of the nerve sheath. This may happen in the ethmoid as well.

The optic nerve in many cases has no bony covering within the sphenoid and the nerve may be involved early causing the loss of sight.

The bony wall that separates the eyeball from the ethmoid cells is very thin and in many instances perforated, or is destroyed. Orbital abscesses develop, or the patient may cause the pus and debris from the ethmoid cavity to enter the orbital cavity by blowing the nose or sneezing, causing an orbital abscess or an emphysema with great swelling and discoloration.

The reason that sinus conditions are more painful at night and the early morning, is that they do not drain while the patient is in a recumbent position. On arising from bed gravity helps the drainage and relieves the pain.

Heat, in the form of hot water over the bridge of the nose, promotes drainage and is grateful to the patient.

A brisk cathartic also helps deplete the secretions. Rest in a warm room and in bed may relieve the acute symptoms. If not, the cavities should be drained and the diseased cells removed.

DIAGNOSIS

Headache in the child or young adult, coming on as the day progresses, growing worse in the afternoon, relieved by sleep or by resting the eyes, indicates eye strain.

Inability to see the blackboard in school, red eye lids with dried secretions on the margins of the lids, history of crops of styes, nausea, vomiting, sick stomach, associated with the above symptoms indicate eye strain.

Sick headache following a day of shopping, riding in a vehicle or street car, pain over

the brow after an evening at the picture show is usually due to eye strain.

Headache, loss of vision, colored circles around the light at night, frequent changes of glasses, smoky cornea, loss of corneal reflex, should make you think of glaucoma.

Headache, coming on periodically in individuals with a high blood pressure or hardened arteries, pain relieved by sleep or rest in darkened room with the above symptoms, means glaucoma.

Headache night and day, better on arising in the morning, growing less as the day progresses, dizziness, vertigo, diplopia or blurred vision, pain located in the base of the skull radiating to the shoulder or mastoid, all indicate sinus involvement.

Frequent head colds, lessened vision on the affected side, diplopia and headache means sinus involvement.

Headache with tenderness over the region of the sinuses is indicative of changes going on within the sinuses; polyp, stuffy breathing, deflated septum, enlarged middle turbinates with the above symptoms, all point to sinusitis.

In conclusion, remember, headache is not a disease but a symptom; find the cause, treat the pathological condition, it matters not whether it is typhoid fever, small pox, sinus infection, eye strain or glaucoma.

Do not prescribe headache powders, for they do but little good and may do harm.

Just a word in reference to glaucoma: Be on the lookout for this condition. It is the early diagnosis and the prompt and proper treatment of these cases that counts. A mistaken diagnosis or treatment means loss of sight, much suffering and discomfort.

The prognosis of these cases is not the best when treated early; late treatment or wrong treatment means blindness. Be careful in the use of mydriatics in people over forty-five. One drop of atropine may do much harm in the eye that has an increased tension or one that is glaucomatous.

Do not let your patients suffer with pain due to pent up pus in the sinuses. The ethmoid is easily drained through the bulla, and the maxillary can be washed out very quickly, and either procedure will make the patient comfortable until the acute symptoms have passed and the patient gotten in condition for a more radical operation.

Prohibit your acute sinus cases from riding in an open car; keep them in a well ventilated room and in bed, if possible. See that the bowels are open and in the beginning a Dover's powder will promote a good sweat and may cut short the attack. Not applica-

tions over the forehead give much relief. Formin and sodium citrate internally stop the chilly sensation and relieve the pain—why, I do not know—but my experience has convinced me that it renders a great service in these cases.

Caution your patients with sinus complications to remain away from public gatherings, especially poorly ventilated show houses. Prohibit the use of snuff and tobacco, especially smoking; avoid smoke-laden atmosphere; see that the body is well clothed, the feet dry and the head covered when in the open air.

Encourage your refraction cases to persist in wearing their correction, especially if that correction be an astigmatic one. Educate the myopic and the hyperope with a large refractive error to choose that vocation that will not require long and severe use of close vision.

Have your patients with strabismus or cross-eyes refracted early and see that they wear their glasses.

Discourage home medication for eye conditions. Be on the lookout for trachoma and when you find a case insist that the lids be properly operated, remembering that this disease may cause blindness, or, if it does not, it is contagious, and the operation will not only conserve the sight, but stop the contagion and eliminate a foci of infection.

Determination of Cure in Gonorrheal Infection of the Male.—Cultures of prostatic and seminal fluids and first urine sediment, carefully collected, according to Russell D. Herrold, Chicago (*Journal A. M. A.*, Jan. 22, 1921), are the most reliable single means of determining whether or not gonorrhea is cured. For this purpose, phosphate agar with blood and ascites fluid is suitable, and the inoculated plates should be incubated under reduced oxygen tension. The complement fixation test is a valuable aid, but the results should be taken in conjunction with the cultural results. Low degree positive fixation may persist up to a year after positive smears and cultures can be obtained. However, with positive serologic reaction, cultures should be repeated at intervals and the patient kept under observation until the serologic tests give negative results. The gonococcus may be identified by agglutination tests with polyvalent antigonococcus serum. A satisfactory antigen can be easily prepared as described in the article. The precipitin tests appears less sensitive; but because of its greater simplicity, it may be used as a substitute for complement fixation under special circumstances. The use of provocative tests before taking cultures and smears is of no advantage.

A CASE OF PSOAS ABSCESS COMPLICATED BY APPENDICITIS, WITH REPORT OF CASE.*

By W. F. GARDNER, Carrsville.

On July 12, 1921, I was called to see a case in consultation with Dr. C. A. Masencup, of Lola. When I reached the home, which was a very humble one and in the very remote part of the county, I found a very sick, emaciated woman. The history of the case is as follows:

Emma P., aged 22. Married one year and five months. Occupation housewife.

Family history: Father living, aged 52, health good; mother living, aged 48, health good; brothers living, four, ages 25, 24, 18 and 12; health all good but one; cause of his bad health, heart trouble. Brothers dead, one. Died in infancy; cause of death unknown. Sisters living, 6; ages 26, 20, 16, 10, 8, and 6, health all good. Sisters dead, none.

Personal history: Has had usual diseases of childhood. Venereal history negative. Had abscess of right breast in May, 1921; did not suppurate. Menstruation began at age of 13; always regular but painful and scanty; menstruated last, July 16, 1921. Has had one child; living, aged three months; health not good on account of being bottle fed. (This child was delivered by a midwife.) No miscarriages. Present illness began five weeks ago with dull pain in the right lower lumbar region, gradually getting worse. Three days prior, pain began in the right iliac region of a sharp, cutting nature, gradually getting worse; abdominal muscles rigid, and vomiting. Bowels slightly constipated, tongue coated and breath very foul. Kidneys regular, skin moist and appetite poor. Had been running a temperature of 99.3-5 to 101. The day I first saw her temperature was 101.3-5, pulse 120 and respiration 22.

Physical examination: Heart and lungs normal. Inspection revealed a bulging about the size of a walnut, two and one-half inches below the anterior superior spine in the ilium, and two and three-fourths inches external to median line on the right side. Palpation very tender over McBurney's point and marked tenderness over the bulging area; tenderness along the lumbar region on the right side. Right limb was flexed and had been for three weeks prior, and could not be straightened without considerable pain.

Vaginal examination: Uterus freely movable, no gross changes in tubes or ovaries.

*Read before the Livingston County Medical Society.

Bilateral laceration of cervix uteri, and slight laceration of perineum.

After a careful examination a diagnosis of psoas abscess, complicated by appendicitis was made, confirming the diagnosis of Dr. Masencup. We without hesitation advised an operation, and after several hours of discussion among the family and friends, they finally decided to have it done. I ordered her moved to the hospital at Rosiclare, Ill., right away, arriving in my town about 9:30 p. m. She remained in Carrsville over night, and was partly prepared for operation, and taken to the hospital early next morning, and the preparations for a laparotomy were completed, the routine of which is familiar to all surgeons; and I operated on her at 9:30, a. m., July 13, 1921.

The abdomen was opened by a midline incision and the abdominal contents carefully examined; the appendix was found to be highly inflamed and bent upon itself. The cecum and part of the small intestine were firmly adhered to the pelvic wall. These adhesions were all broken up and the appendix was removed, the stump carbolized, followed with alcohol, and buried into the cecum by a purse string suture. The meso was ligated, and the abdomen closed in the following manner; the peritoneum closed with No. 1 plain catgut; the deep and superficial fascias and muscle were closed with No. 2 chromic catgut, and the skin with silkwormgut without drainage.

The incision and sutures were mopped with pure iodine and a sterilized dressing applied covered with an impregnable dressing, and the edges sealed with collodion as a protective measure against contamination from other sources. I next incised the abscess which was pointing two and one-half inches below the anterior superior spinous process of ilium, and two and one-fourth inches external to median line, and removed sixteen ounces of pus and blood. The pus was thick and yellow and had a very foul odor. The abscess sinus was directed backward for two inches then upward for five inches, making a sinus seven inches in length. The opening was then irrigated with normal salt solution and swabbed out with 50% iodine and alcohol. A stab wound was made through the tissues to the back and a large rubber drainage tube well fenestrated passed through the sinus, providing through and through drainage. The wound was dressed in the usual way. The operation was completed in forty-five minutes and the patient returned to her ward, condition as follows: pulse, 120, very weak; respiration, 20, and feeble. I ordered a Murphy drip of glucose and coffee given

her two hours on and two hours off for the first twenty-four hours; digitaline per (H) every six hours until ordered discontinued. At 10:30 p. m., the pulse went up to 140, respiration 30, and she was very restless. I ordered one and a half pints of normal saline given her per hypodermoclysis. At 9:30 a. m., July 14, the pulse had come down to 110, with better volume, and respiration 20.

No infection developed in the abdominal incision.

The post-operative treatment was as follows: The abscess wound was irrigated twice daily with normal salt solution, for the first week, turning the drainage tube at each irrigation. The wound was then irrigated the remainder of the time with a 2% solution of chlorazane. At the end of the second week the large tube was removed and a smaller drainage tube inserted of the same kind and in the same manner as the larger one. This tube remained in place for one week longer and was dispensed with and wick drain of gauze was inserted into the wound, carried well down to the bottom, until complete healing was effected, which covered a period of seven weeks.

NEWS ITEMS AND COMMENTS

Dr. M. L. Ravitch, formerly of Louisville, Ky., announces the removal of his office to Suite 2013, Mallery Building, 5 So. Wabash avenue, Chicago, Illinois. Practice limited to Dermatology and Radiotherapy. Hours: 9-1 p. m. Phone Randolph 408. Residence 455 Barry avenue. Phone Graceland 9303.

Dr. Octavus Dulaney, formerly with Baird-Dulaney Hospital, Dyersburg, Tennessee, announces that he has located in Louisville, Ky., and that his practice will be limited to Ear, Nose and Throat. Offices 520-21 Starks Building.

Effect of Cholesterinemia on Wassermann Test.

—The feeding of 1.25 gm. cholesterin per kilo of body weight to rabbits Craig and Williams found resulted in an enormous accumulation of cholesterin in the blood, an accumulation that persists, in some instances, for several days after the feeding is stopped. However, there is no relationship between the cholesterin content of the blood serum of rabbits and the results of the Wassermann test, all of the animals experimented on giving a consistently negative reaction despite the enormous increase in the cholesterin content of their blood serum resulting from the feeding of this substance.

Kentucky Medical Journal

PUBLISHED MONTHLY BY
THE KENTUCKY MEDICAL ASSOCIATION
Incorporated

Entered as second class matter October 22, 1906 at the Postoffice at Bowling Green, Ky., under act of Congress, March 3, 1879.

Subscription Price\$2.00

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ANNUAL MEETING, PADUCAH, 1922.

COUNTY SOCIETY REPORTS

Fleming—Present at regular meeting, October 12, 1921, J. B. O'Bannon, C. R. and C. L. Garr, A. S. Robertson, T. Ribelin, W. W. Dye, E. T. Runyan and Chas. W. Aitkin. Minutes of meeting of August 10 approved. No meeting held in September. The hour of meeting was changed from three to two o'clock. The subject of Cancer was discussed. C. R. Garr considered the disease as second in importance to no other unless it was tuberculosis. He reported four cases of Melanotic Sarcoma.

W. W. Dye reported several cases of cancer and one of benign tumor of breast, which he advised to be removed. He advocated the knife first, then radium.

T. Ribelin spoke of the malignancy of warts and advised early removal as a "safety first" process.

A. S. Robertson discussed the degeneration of moles and urged that they be extirpated early.

J. B. O'Bannon had seen various forms in various locations and for skin and uterine malignant growths he advocated the use of radium; he made reference of three special cases.

C. L. Garr referred to the predilection of the breast and uterus of malignant diseases. He also referred to Marsden's paste succeeding in some surface malignancies where there had been a recurrence after use of knife. He strongly condemned fakeism in connection with treatment of cancer, in which the entire Society heartily concurred.

E. T. Runyon made report of a case of Lympho Sarcoma. Methylene blue was used and a tonsillectomy done, a recurrence and a deeper involvement followed to a fatal termination.

C. W. Aitkin reported three apparently successful treatments done three and four years ago of malignant disease of uterus and two cases without any benefit, under radium treatment. The two unbenefitted cases had operative work followed by radium, and the three cases apparently relieved had radium only, from four to six sittings.

The Society was unanimous in its opinion as to early operative work where at all advisable, and to the use of X-ray and radium in all cases where operative work was not deemed best.

CHAS. W. AITKIN, Secretary.

Harlan—The regular meeting of the Harlan County Medical Society was held October 15, at which two new officers were elected to fill out the balance of unexpired terms.

W. E. Riley, of Lynch, was elected President to fill out the term of Dr. Jasper, who has left the county, and **J. E. Johnson**, of Harlan, to fill out the unexpired term of R. J. Malott, Secretary and Treasurer. The new officers should be elected again the first of January, according to the

local constitution. This present arrangement will make Dr. Riley delegate to the next State Association, according to the same constitution.

We had a very good meeting and have taken up the new plan of having actual cases reported and discussed rather than having set papers. Several members reported interesting cases and the discussion following was of benefit to all present. Considerable interest was manifested by all the members present.

I wish to call to your attention the fact that all but two of the physicians eligible for membership have now paid in their dues and are members of the County and State Societies.

RALPH J. MALOTT, Secretary.

Ohio—At a regular meeting of the Ohio County Medical Society the following resolutions were adopted relative to the death of C. R. Bennett, whose sudden death occurred October 2, 1921:

Whereas the Great Physician, in His infinite wisdom and goodness, has seen fit to summon Charles Ross Bennett to cross the great divide and enter into his eternal abode:

Be it Resolved, That in his death the medical profession has lost one of its best practitioners, his community a useful, valuable and upright citizen, his family a loyal and faithful husband, an obedient son and a kind father, and the Ohio County Medical Society one of its best workers and most enthusiastic members. Dr. Bennett was regular in his attendance at our meetings, always expressed his opinions freely on any subject under discussion, and used his best efforts to make the meetings interesting and profitable.

We were all shocked and overcome with grief when we heard of his sudden death. His vacant chair will long be noticeable when our society meets and he will be remembered by all of us as one of the most genial and lovable members of the medical profession with whom it has been our good fortune to have been associated.

Be it further Resolved that a copy of these resolutions be sent to the bereaved family, a copy sent to each of the county papers for publication and a copy spread upon the minutes of our Association.

PAL T. WILLIS, President.
OSCAR ALLEN, Secretary.

BOOK REVIEWS

The Assessment of Physical Fitness—By Correlation of Vital Capacity and Certain Measurements of the Body—By Georges Dreyer, C. B. E., M. A., M. D., Fellow of Lincoln College, Professor of Pathology in the University of Oxford. In collaboration with George Fulford Hanson. With a Foreword by Charles H. Mayo, M. D., Rochester, Minn. Cloth, Pp. 128, with xxiv Tables. Price \$3.50 net. New York: Paul B. Hoeber, Publisher.

This is a book that should command the attention of all physicians who are interested in industrial medicine, actuaries of insurance companies, Public Health nurses and settlement workers, for the reason that unlike most books on the same lines, the author contends that the occupation of the individual plays a large part in his physical dimensions.

In the past, insurance companies have had hard-and-fast rules as to what the physical dimensions should be to make the applicant acceptable irrespective of his occupation, and the same remark applies to all those investigators of physical fitness who have followed the matter with more or less interest. Dr. Dreyer divides all workers into three classes and shows the differences in the physical measurements between Class A and Class B—men who have undergone prolonged physical training, or have an occupation which leads to muscular development, and men of the professional and business classes. Class C contains those who lead an extremely sedentary life, which it can readily be understood makes for a greater degree of under-development than would obtain among those of Class A or B. Hence the new note in a book on physical fitness and one that is inclusive of matters which have been overlooked by other authors, and on account of their neglect have given a one-sided account of the matter.

To quote Dr. Mayo who wrote the Foreword: "The importance of the physical fitness of man has been only partially appreciated in the estimate of prognosis by physicians in the examination of the sick and in the measurement of the lung capacity by examiners for insurance companies. Dr. Georges Dreyer has shown that the estimation of vital capacity is more than a mere test, that it indicates the tendency to health and resistance to disease, and that in a prognosis of life's duration it parallels very closely the results of a general examination."

The American Year Book of Anesthesia and Analgesia.—By F. H. McMechan, Editor Pharmacology-Physio-Pathology of Anesthesia and Analgesia are new chapters that have been added as well as all the progress in these subjects that are of interest to the anesthetist, dentist, research worker and surgeon. The book is well illustrated and has as its contributors such authorities as Donald Guchree, F. A. Williams, J. H. Cotton, Palu Cassidy. Surgery Publishing Co., 15 E. 26th street, New York City, Publishers.

Icebox Modification of Wassermann Test.—The study presented by Keidel and Moore is intended to demonstrate the results of the icebox method in cases well studied and not dependent for diagnosis on this method. It has demonstrated an important superiority in its selection of uncured treated syphilis.

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VOL. XIX.

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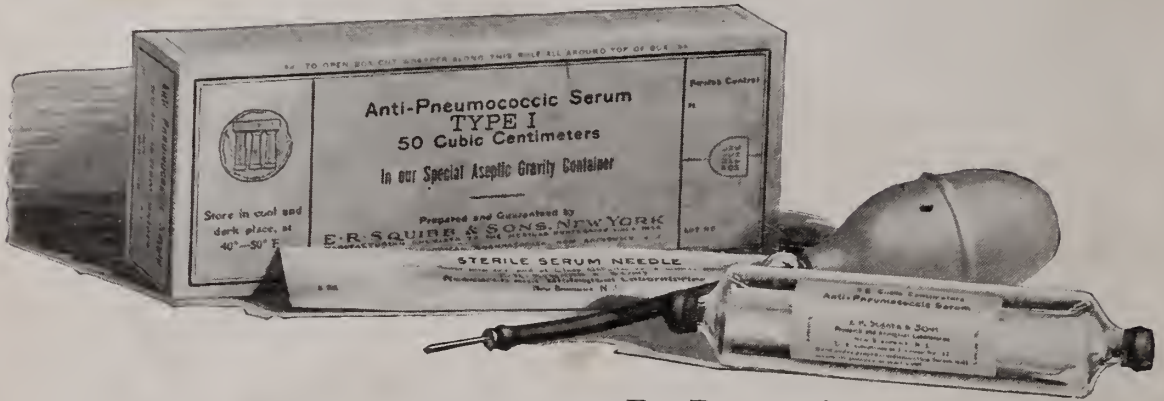
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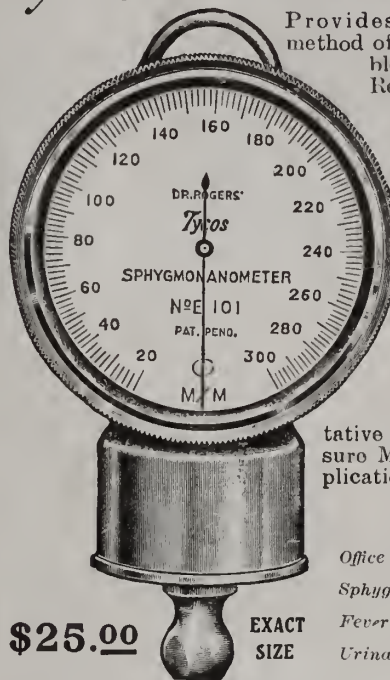
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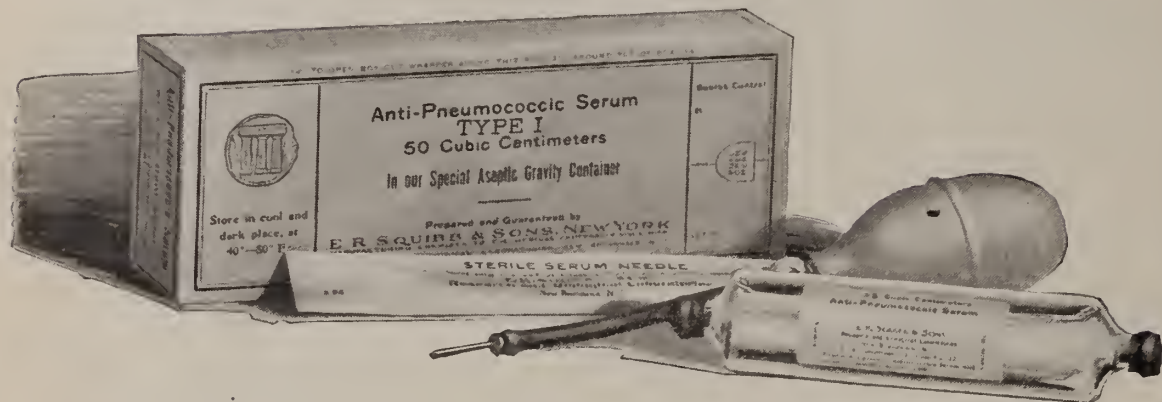
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BOWLING GREEN, KY., APRIL, 1921

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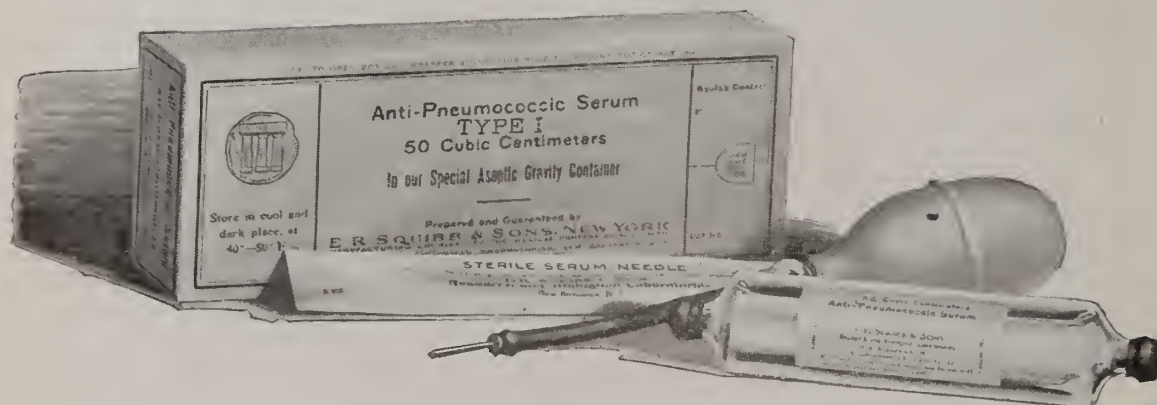
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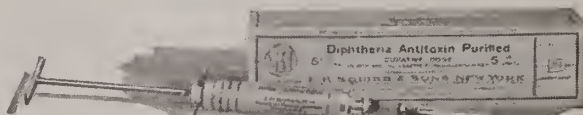
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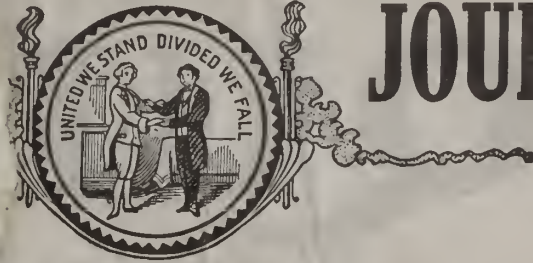


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Entered as Second-Class Matter, May 2, 1906, at the Postoffice at Bowling Green, Ky. Acceptance for mailing at special rate of postage provided for in Act of October 3, 1917, authorized May 25, 1920.

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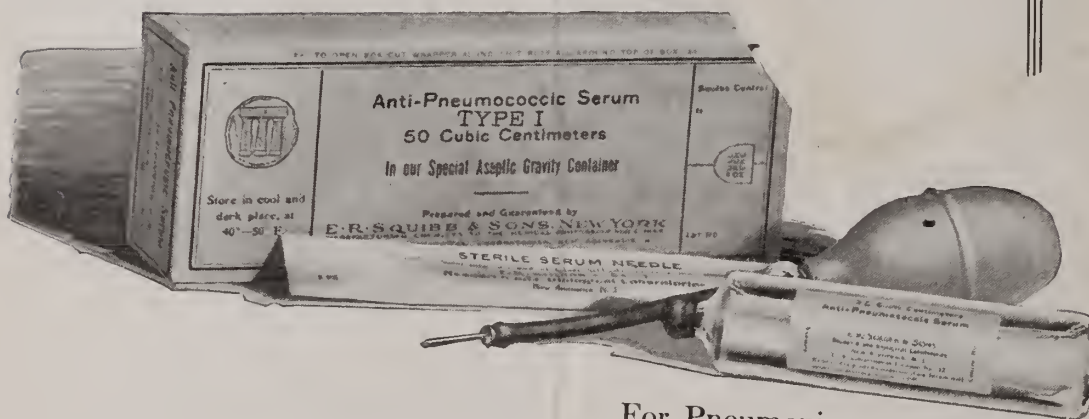
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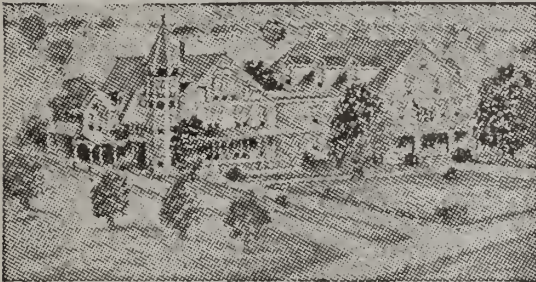
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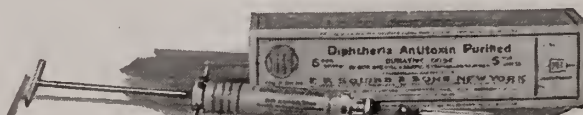
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VOL. XIX.

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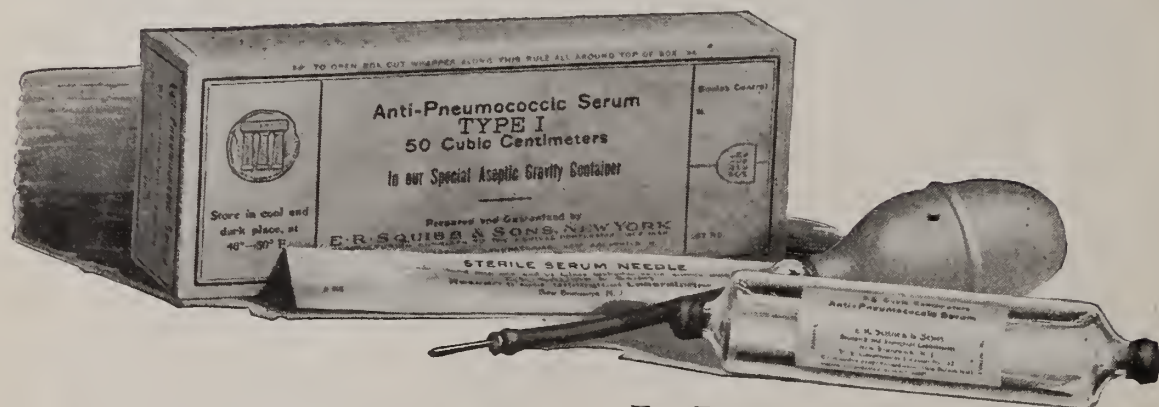
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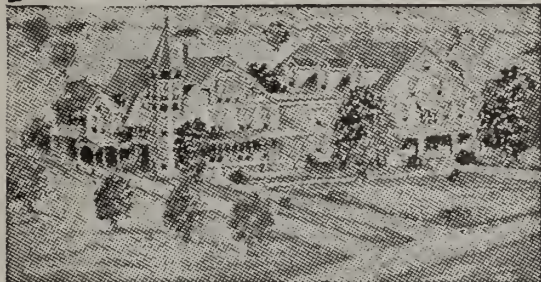
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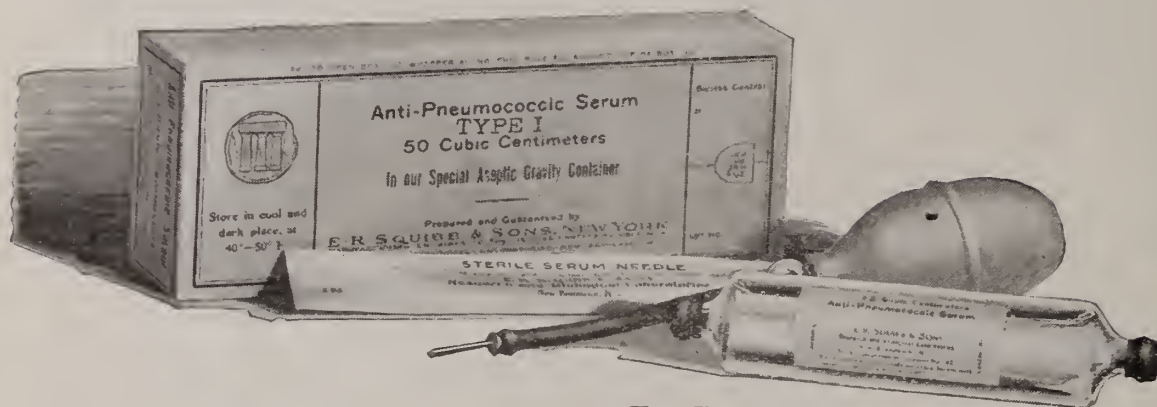
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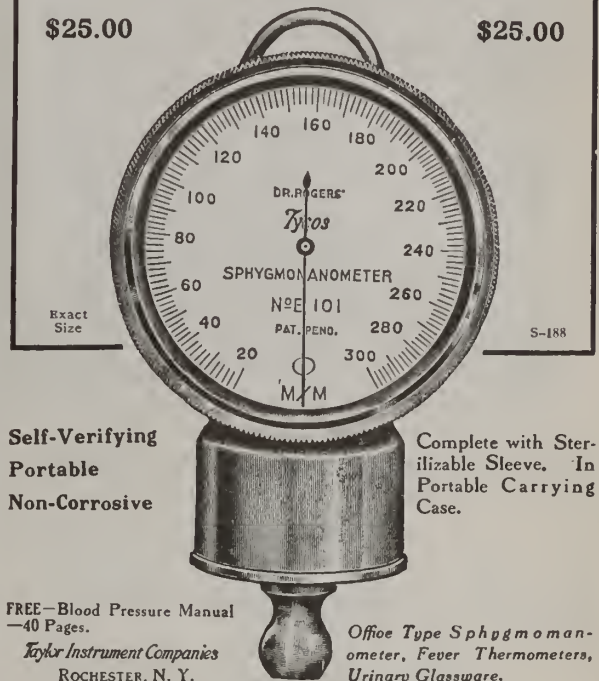
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Entered as second-class matter, Oct. 22, 1906, at the Postoffice at Bowling Green, Ky. Acceptance for mailing at special rate of postage provided for in section 1103, act of October 3, 1917, authorized May 25, 1920.

VOL. XIX.

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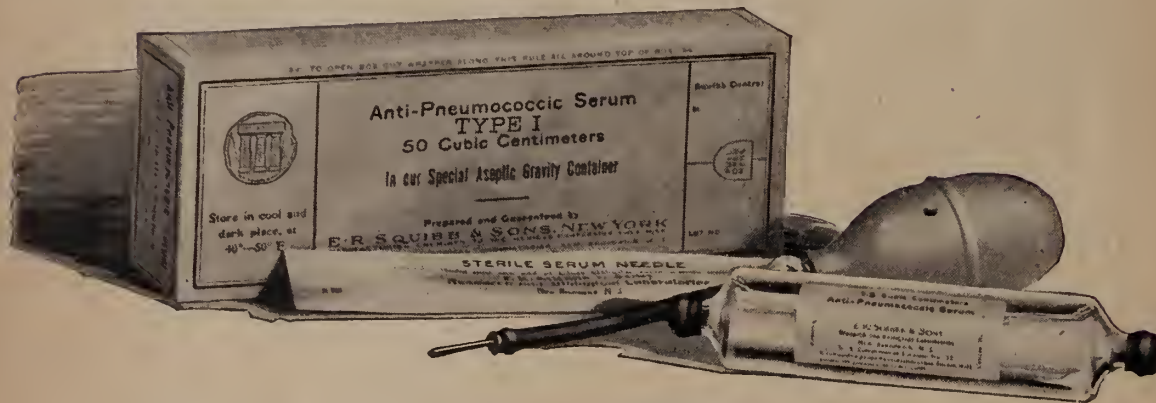
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VOL. XIX.

BOWLING GREEN, KY., NOVEMBER, 1921

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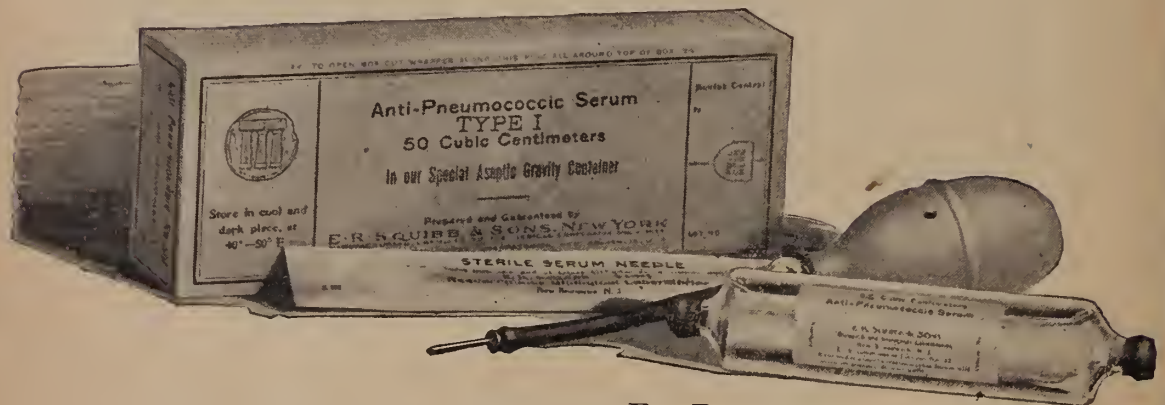
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